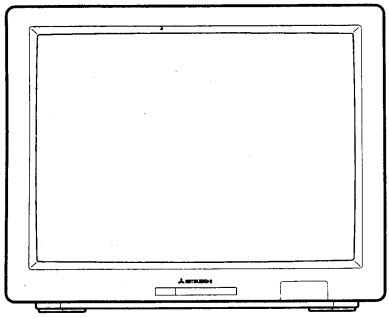
1994

MITSUBISHI Service Manual

40" COLOR TV
YA-0 CHASSIS



MODEL

CS - 40503

CAUTION

Before servicing this chassis, it is important that the service person reads the "SAFETY PRECAUTIONS" and "PRODUCT SAFETY NOTICE" in this service manual.

SPECIFICATIONS

• **Power Input**	AC 120V; 60Hz
• **Speaker**	3.9" Round type, 2 pcs.
• **Power Consumption**	260W
• **Chassis**	YA-0
• **Picture Tube**	M100KWX11X 40" V110° Deflection
• **Picture high voltage**	34kV (at 2mA)
• **Reception Frequency**	VHF 54 ~ 470MHz UHF 470 ~ 806MHz
• **Cabinet Dimensions**	38.2" (W) x 31.7" (H) x 26.8" (D)
• **Weight**	244.6 lbs.

• Weight and dimensions shown are approximate.
• Design and specifications are subject to change without notice.

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SAFETY PRECAUTIONS

NOTICE: Observe all cautions and safety related notes located inside the receiver cabinet and on the receiver chassis.

WARNING

1. Operation of this receiver, outside the cabinet or with the cover removed, presents a shock hazard from the receiver power supplies. Work on the receiver should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high-voltage equipment.
2. Do not install, remove or handle the picture tube in any manner unless shatter-proof goggles are worn. People not so equipped should be kept away while the picture tube is being handled. Keep the picture tube away from the body while handling.
3. When service is required, observe the original lead dress. Extra precaution should be given to assure correct lead dress In the high voltage area. Where a short-circuit has occurred, replace those components that indicate evidence of overheating.

X - RADIATION WARNING

The surface of the cathode ray tube may generate X-Radiation. Take precautions when servicing and, if possible, the use of a lead apron is recommended for shielding while handling.

When replacing the cathode ray tube use only the designated replacement part since it is a critical component with regard to X- Radiation as noted above. (No high-voltage adjustments are provided.) The high-voltage specification is described on the cover page.

LEAKAGE CURRENT CHECK

Before returning the receiver to the customer, it is recommended that leakage current be measured according to the following methods.

1. Cold Check

With the AC plug removed from the AC source, place a jumper across the two AC plug prongs. Turn the receiver AC switch on. Using an ohm-meter, connect one lead to the AC plug and touch the other lead to each exposed metal part (antennas, handle bracket, metal cabinet, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistance reading of 1 meg ohm. Any resistance below this value indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

2. Hot Check

Use the circuit in Fig. 1 to perform this test.

(1) With switch S1 open, connect the receiver to the measuring circuit. Immediately after connection, measure the leakage current using both positions of switch S2, and with the switching devices in the receiver in all of their operating positions.

(2) Switch S1 is then closed, energizing the receiver. Immediately after closing the switch, measure the leakage current using both positions of switch S2, and with the switching devices in the receiver in all of their operating positions. Current measurements of items (1) and (2) are to be repeated after the receiver has reached thermal stabilization. The leakage current shall not be more than 0.5 milliampere.

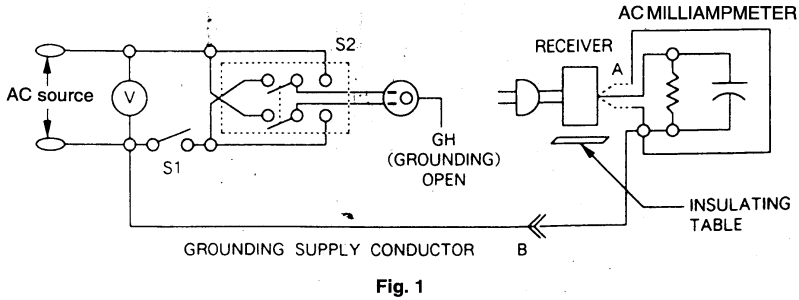


Fig. 1

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in television receivers have special safety related characteristics. These characteristics are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Replacement parts which have special safety characteristics are identified in this service manual.
Electrical components having such features are identified by shading on the schematic diagram and the parts list of this service manual and by the supplementary sheet for this chassis to be issued subsequently. Therefore replacements for any safety parts should be identical in value and characteristics.

DISASSEMBLY

How to Lift a Set

Hold both the lower Convex Part (Part Ⓐ) and the bottom (Part Ⓑ) on both sides. Lift up the unit carefully. (Fig. 2-1, 2-2 and 2-3.)

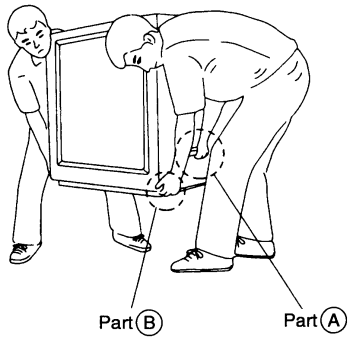


Fig. 2-1

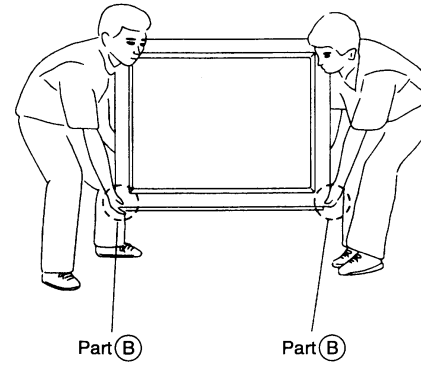


Fig. 2-2

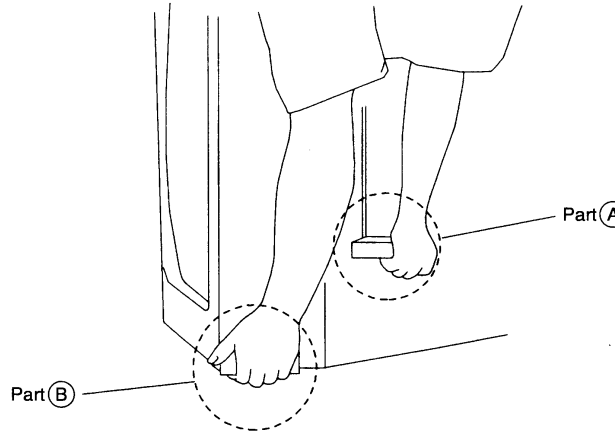


Fig. 2-3

Removal of PCB's

- PCB - SIGNAL
- PCB - DEFL
- PCB - DBF
- PCB - AV
- PCB - CRT/SVM
- PCB - HF
- PCB - DCF
- PCB - PIP
- PCB - POWER-SUB
- PCB-AV-FRONT
- PCB-PREAMP

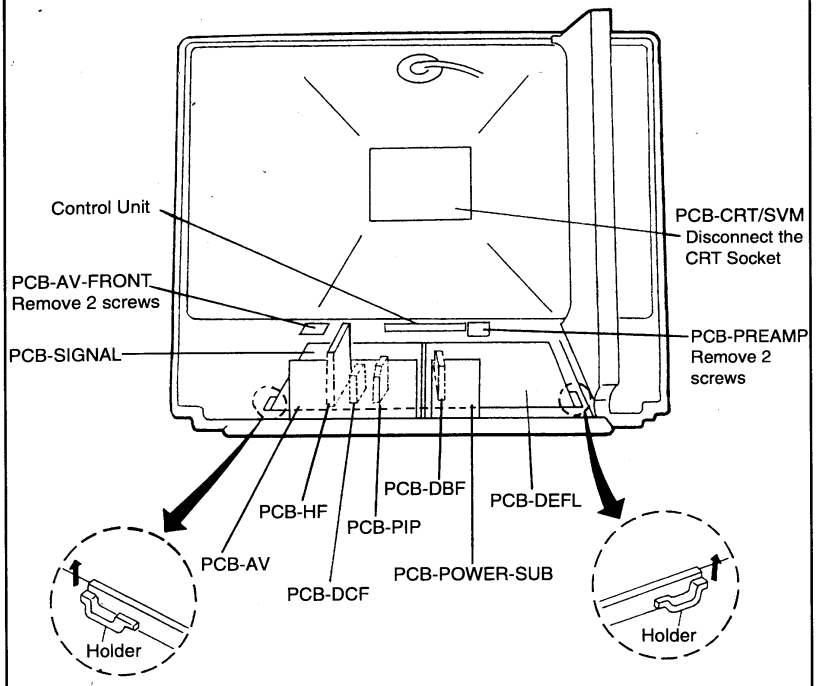


Fig. 3

Chassis Assy (PCB-SIGNAL, PCB-DEFL, PCB-HF, PCB-DCF, PCB-DBF, PCB-PIP, PCB-AV, PCB-POWER-SUB)

Extension Cord Jig Table

Part No.	Printed Circuit Board	Connector
859C431O20	PCB-PIP	GE (9 pin), GF (11 pin)
	PCB-AV	AA (11 pin), AB (15 pin), AV (13 pin)
	PCB-DCF	EX (9 pin)
	PCB-HF	HB (11 pin), HC (15 pin)
	PCB-DBF	LB (5 pin)
859C431O60	PCB-DBF	DE (3 pin)

CRT Replacement

GENERAL

In some instances, after CRT replacement, Purity and Convergence may require adjustment. If it is required, follow the procedure described in the alignment section of this manual.

CAUTION: Safety goggles must be worn at all times when handling the CRT.
CAUTION: The CRT is extremely sensitive to mechanical shock, therefore care must be taken at all times when handling the CRT.

SUGGESTED TOOLS

The following tools are useful for replacement and final adjustment of the CRT, and is available through the National Parts Department.

1. T-TYPE BOX DRIVER # 859C358O20 (Fig. 4)
2. An 11/16-inch box wrench.

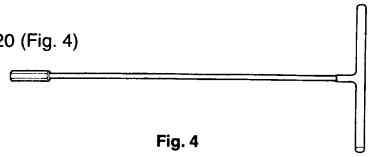


Fig. 4

CRT Removal Procedure

Caution: Servicepersons must wear personal protective equipment, including safety shoes, helmets, eye guards and gloves.

1. Remove 19 screws retaining the Back Cover and remove the Back Cover. (Fig. 5-1)
2. Carefully discharge the CRT to the ground on PCB-CRT/SVM.

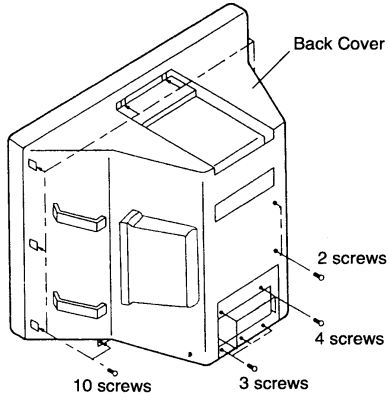


Fig. 5-1

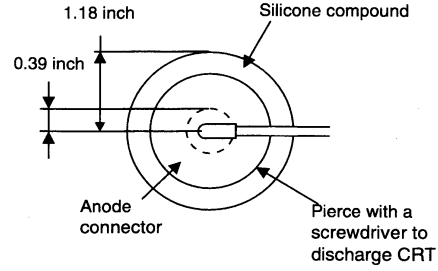


Fig. 5-2

3. Disconnect the anode connector from the CRT.
4. Remove the stay-cabinet.
   Procedure
   1) Remove 2 screws at the top of the stay-cabinet. (Fig. 5-3)
   2) Keep pressing the base downward, hold part Ⓐ , pull the stay-cabinet to the direction of ① and release the base from the stopper. (Fig. 5-3 and 5-4)
   3) Pull the stay-cabinet to the direction of ② , release the base from the hooks to remove the stay-cabinet.

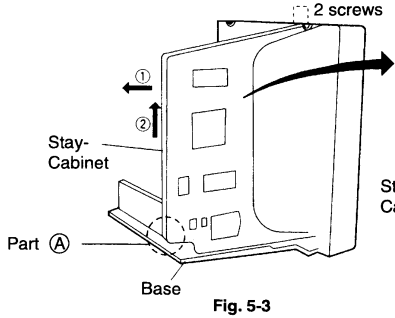


Fig. 5-3

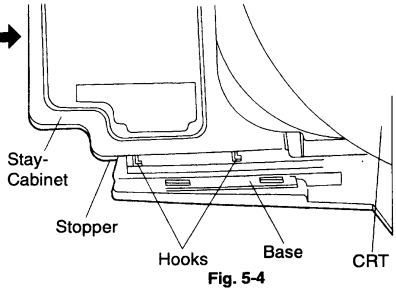


Fig. 5-4

5. Remove the PCB-CRT/SVM and chassis assy (PCB-SIGNAL, PCB-DEFL, PCB-DBF, PCB-PIP, PCB-DCF, PCB-HF, PCB-AV, PCB-POWER SUB).
6. Place a thick cushion or slab of foam rubber on the floor and carefully lie the set on its face, taking care not to strike or scratch the face of the CRT. (Fig. 5-5)
7. Remove the CRT mounting Hex nuts and washers. (Fig. 5-5)

Note: Remove the Hex nuts with an 11/16-inch box wrench.

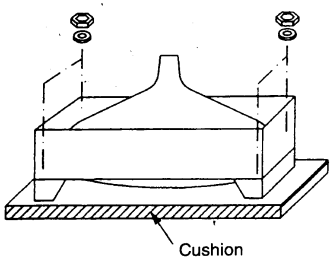


Fig. 5-5

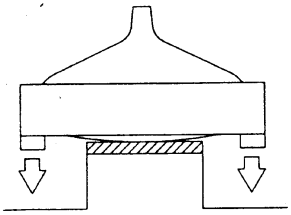


Fig. 5-6

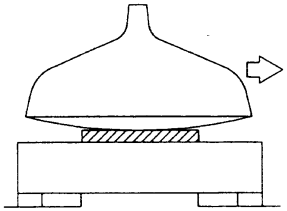


Fig. 5-7

8. Lift the front cabinet and set the face of the CRT on the cushion. (Fig. 5-6)
9. Remove the CRT grounding wire and degaussing coil.
10. Replace the CRT with the new one. For installation of the CRT, reverse the above procedure. (Fig. 5-7)

Note: Apply silicon compound to the surface of the CRT around the anode connector to insulate.

Removal of Connectors

The connectors connecting PCB-HF are more firmly secured than conventional ones.
The connectors cannot be easily removed just by pulling. To remove the connectors, follow the steps given below.

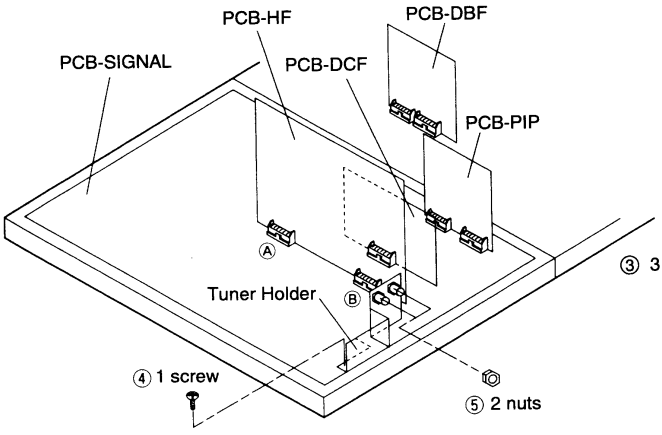


Fig. 6-1

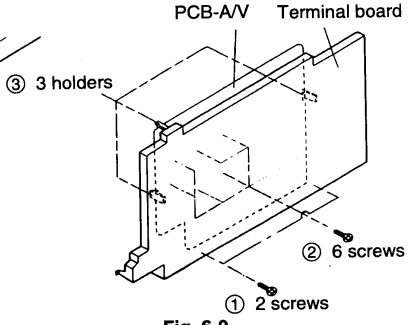


Fig. 6-2

Removal of PCB-HF

1. Remove the back cover.
2. Remove 2 screws (①) and 6 screws (②). (refer to Fig.6-2.)
3. Detach 3 holders (③) and remove the Terminal Board from the PCB-AV. (refer to Fig. 6-2.)
4. Remove the PCB-AV from the PCB-SIGNAL.
5. Remove 1 screw (④) and 2 nuts (⑤) and detach the Tuner Holder from the PCB-SIGNAL. (refer to Fig. 6-1.)
6. Insert a narrow minus screwdriver in the top of connector assembly Ⓐ of the PCB-SIGNAL. Push the hook of the connector in direction ❶, as shown in Fig. 6-3. Raise the PCB-HF in the direction of ❷ to unhook the PCB-HF.
7. Insert the narrow minus screwdriver from the side into connector assembly Ⓑ of the PCB-SIGNAL. Push the hook of the connector in the direction ❶, as shown in Fig. 6-4. Raise the PCB-HF in the direction of ❷ to remove the PCB-HF from the PCB-SIGNAL.

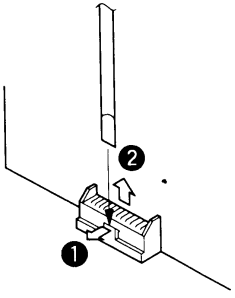


Fig. 6-3

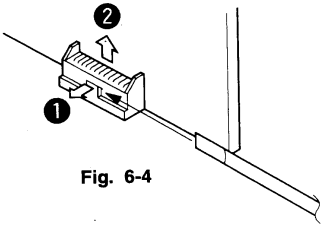


Fig. 6-4

Removal of the Speaker Box

1. Remove the Back Cover. (Fig. 5-1)
2. Remove the 4 screws retaining the Speaker Box. (L and R sides) (Fig. 7)

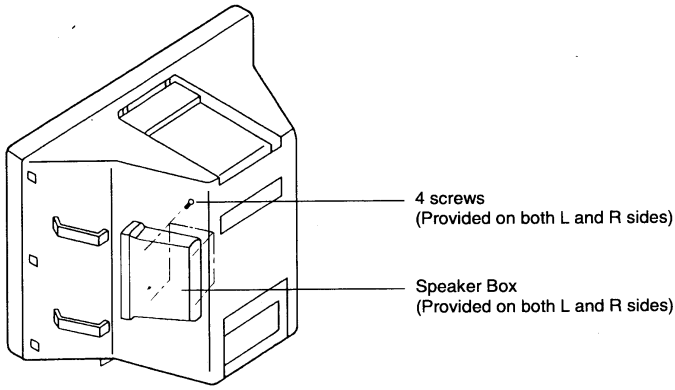


Fig. 7

Removal of the Control Unit

1. Remove the Back Cover. (Fig. 5-1)
2. Carefully discharge the CRT to the ground on PCB-CRT/SVM. (Fig. 5-2)
3. Disconnect the anode connector from the CRT.
4. Remove the Stay-Cabinet. (Fig. 5-3, Fig. 5-4)
5. Remove the PCB-CRT/SVM and Chassis Assy. (Fig. 3)
6. Remove the 4 screws retaining the Control Unit. (Fig. 8-1, Fig. 8-2)

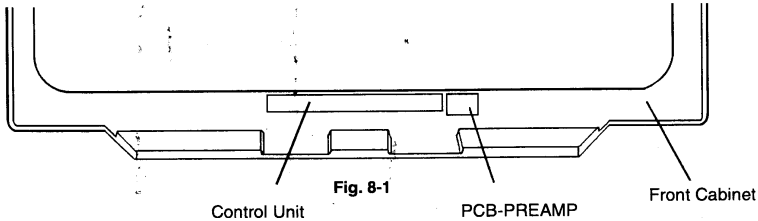


Fig. 8-1

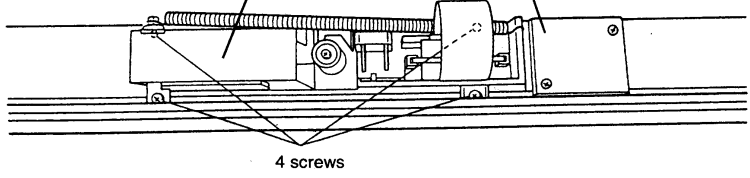


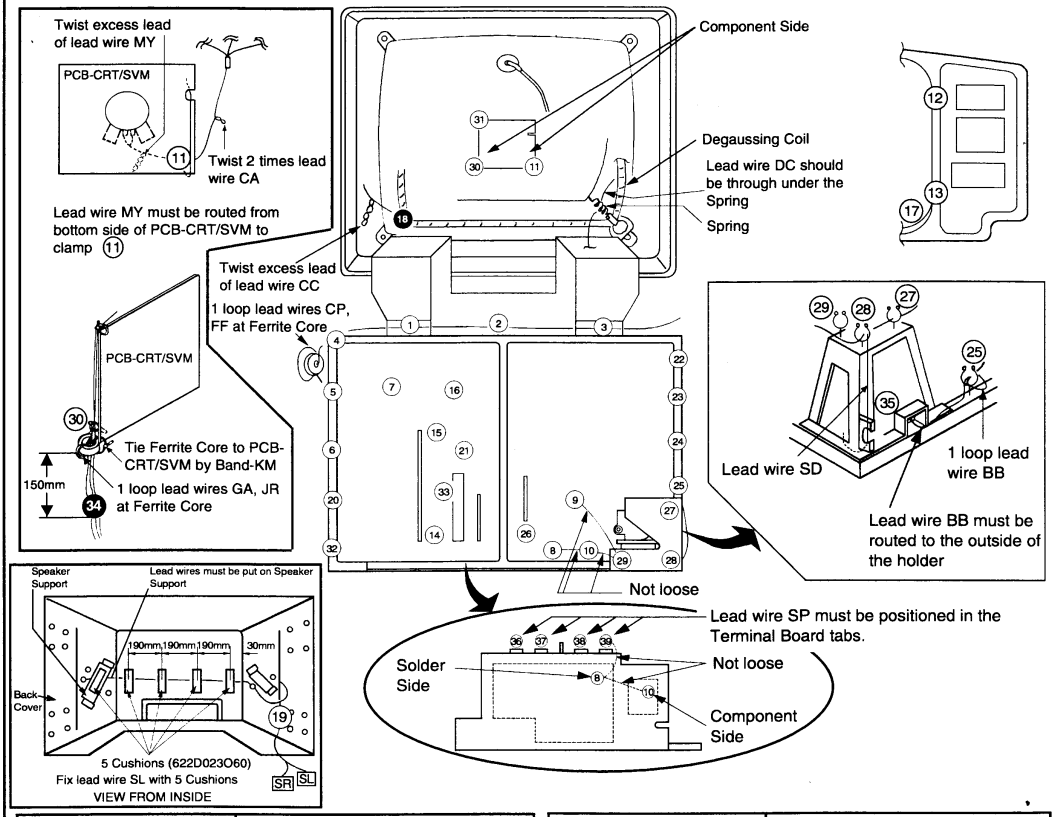
Fig. 8-2

LEAD DRESS

The lead wires to be clamped are listed in the table below.

NOTE: The inner wires are clamped so that they do not come close to the heat generating or high voltage parts. After servicing route all wires in their original position.

* The anode lead wire is routed so that no tensile strength is applied to the cap. If the route of the anode lead wire is changed, return them to the initial route shown below.
* Reverse printed characters indicates aerial clamp.


Twist excess lead of lead wire MY
PCB-CRT/SVM
Twist 2 times lead wire CA
Lead wire MY must be routed from bottom side of PCB-CRT/SVM to clamp (11)
Component Side
Degaussing Coil
Lead wire DC should be through under the Spring
Spring
Twist excess lead of lead wire CC
1 loop lead wires CP, FF at Ferrite Core
PCB-CRT/SVM
Tie Ferrite Core to PCB-CRT/SVM by Band-KM
150mm
1 loop lead wires GA, JR at Ferrite Core
Lead wire SD
1 loop lead wire BB
Lead wire BB must be routed to the outside of the holder
Not loose
Lead wire SP must be positioned in the Terminal Board tabs.
Solder Side
Not loose
Component Side
Speaker Support
Lead wires must be put on Speaker Support
190mm,190mm,190mm
30mm
Back Cover
5 Cushions (622D023O60)
Fix lead wire SL with 5 Cushions
VIEW FROM INSIDE
SR
SL

LEAD WIRE	CLAMP
ANODE LEAD WIRE	⑫ - ⑬
FOCUS LEAD WIRE	㉘ - ㉙ - ⑪
SCREEN LEAD WIRE	㉘ - ㉙ - ⑪
AC	⑦ - ⑮ - ⑭
AH	㉝
BB	㉔ - ㉕ (1 loop)
CA	⑪
CC	⓲
CE	④ - ⑦ - ⑮ - ⑭
CP	② - ① - ④ - ⑤
DC	③ - ⑦
DF	㉖ - ⑧ - ㉙ - ㉘ - ㉗
DR	㉒ - ㉓ - ㉔ - ㉕ - ㉗ - ㉘
DV	⑧
DY	⑨ - ⑩
F1	㉘ - ㉙ - ⑪

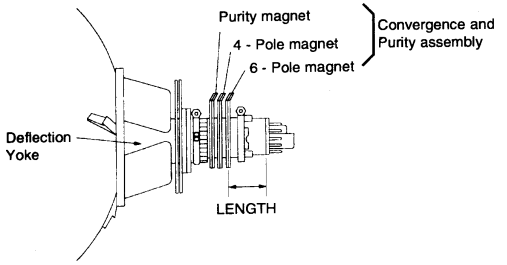
LEAD WIRE	CLAMP
F2	㉘ - ㉙ - ⑪
FF	② - ① - ④ - ⑤ - ⑥
FG	㉗ - ㉘ - ㉙ - ⑪
GA	㉚ - ㉞ - ㉑
HD	㉛ - ㉚ - ⑧ - ⑩ - ⑨
HP	⑪ - ⑧ - ㉖
JR	㉑ - ㉞ - ㉚
KC	④ - ① - ②
KK	⑯ - ⑦ - ① - ②
MY	⑪
PQ	⑨ - ⑩ - ㉙ - ㉘ - ㉗
SD	⑪ - ㉙ - ㉘
SL	㉜ - ⑳ - ⑲
SP	⑧ - ㊴ - ㊳ - ㊱
SR	㉜ - ⑳ - ⑲

ITC ADJUSTMENT

Before adjusting the INTEGRATED TUBE COMPONENT, run the CRT for more than an hour with a monochrome signal applied to give normal beam current flow.

- ITC adjustments should be performed in the following sequence after replacing either the CRT, deflection yoke or purity and convergence magnetic assembly.
  When not replacing parts, perform only the necessary adjustment.
- Installation.

a) Put the deflection yoke on the neck of the CRT, fully forward against cone.
b) Put the purity and convergence assembly on the neck of the CRT so that the distance between the 6-pole magnet and the base of the tube is as indicated in Table 1, and tighten screw by hand.



LENGTH
2.28±0.04 inches (58.0±1.0mm)

Table 1

Preliminary Adjustment

a) Degauss front and rear of the CRT, CRT holder and the front and sides of the cabinet. Don't allow the degaussing coil near the deflection yoke, purity and convergence magnetic assembly.
   (Insufficient degaussing can prevent suitable color purity adjustment.)
b) Run the CRT for more than an hour with a white raster signal, to allow normal beam current.
c) Make sure that all electrical adjustments have been performed.
d) Set the magnetic strength to minimum.
   Then complete the six steps of 4-pole, 6-pole and purity magnets alignment.

1. Purity

Adjustment purpose Insure the R, G and B beams hit the correct phosphors.

Symptom when incorrectly adjusted Color patches appear.

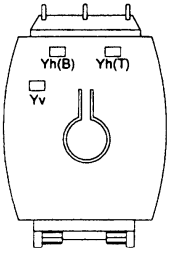
Input signal	VIDEO signal (white raster)
Input terminal	VIDEO IN terminal

1. Supply a VIDEO signal (white raster).
2. Set the model to the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2".
4. Set the adjustment item to "BKB".
5. Set the adjustment data to "00" to change the color of the screen into yellow.
6. With the deflection yoke positioned fully forward, adjust the purity magnet so that the yellow bar is at the center of the screen with normal vertical centering.
7. Slide the deflection yoke slowly backwards to produce a uniform yellow raster.
8. Produce the primary color raster: red, green and blue, refer to steps 9, 10 and 11, and check that no contamination is observed in each color.
9. To produce a red raster, set the adjustment data of adjustment item "BKR" to the standard value and set the adjustment data of "BKG" and "BKB" to "00". Make sure that the purity of a red raster is optimum.
10. To produce a green raster, set the adjustment data of adjustment item "BKG" to the standard value and set the adjustment data of "BKR" and "BKB" to "00". Make sure that the purity of a green raster is optimum.
11. To produce a blue raster, set the adjustment data of adjustment item "BKB" to the standard value and set the adjustment data of "BKR" and "BKG" to "00". Make sure that the purity of a blue raster is optimum.
12. Tighten the deflection yoke in position.
13. Set the adjustment data of adjustment items "BKR", "BKG" and "BKB" to the standard values. (Press "ENTER" after setting data and before selecting the next adjustment item.)
14. Terminate the circuit adjustment mode, press the menu button twice.

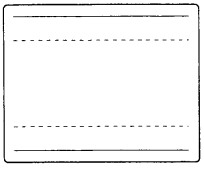
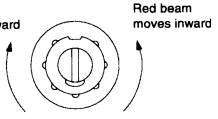
Adjustment Item	Standard Value
BKR	01
BKG	01
BKB	01

5. Yv correct	**Adjustment purpose**	Correct color divergence of R, G and B horizontal lines at the top and bottom of the picture.
	Symptom when incorrectly adjusted	Color edging around horizontal line at the top and bottom of the picture.

Input signal	VIDEO signal (crosshatch)
Input terminal	VIDEO IN terminal



* Before adjusting, be sure to tighten the deflection yoke in position.
1. Supply a VIDEO signal (crosshatch).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2".
4. Set the adjustment item to "BKG".
5. Set the adjustment data to "00".
6. When lines do not converge at the upper and lower portion of the screen, turn the adjusting potentiometer, Yv, clockwise.
   Rotate counter-clockwise when the beam diverging directions are opposite to the example shown below.

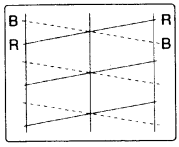
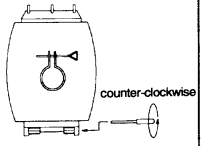
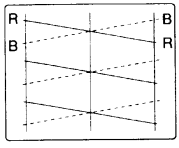
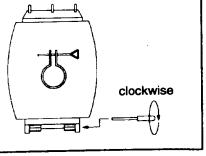
	Direction of divergence	**Adjusting potentiometers**
Yv		

7. Re-set the adjustment data to "01".
8. Terminate the circuit adjustment mode. (Press "MENU" twice)

6. Xv correct	**Adjustment purpose**	Correct color divergence of R, G and B horizontal lines at the sides of the picture.
	Symptom when incorrectly adjusted	Color edging around horizontal lines at the sides of the picture.

Input signal	VIDEO signal (crosshatch)
Input terminal	VIDEO IN terminal

* Before adjusting, be sure to tighten the deflection yoke in position.
1. Supply a VIDEO signal (crosshatch).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2".
4. Set the adjustment item to "BKG".
5. Set the adjustment data to "00".

Type of Misconvergence	Core position
	
	

6. When beam lines do not converge at left and right portion of the screen, adjust vertical cross (Xv) with the horizontal differential coil as shown above.
7. Re-set the adjustment data to "01".
8. Terminate the circuit adjustment mode. (Press "MENU" twice)

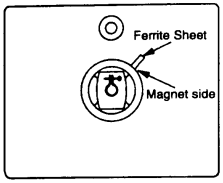
7. Convergence of screen corner

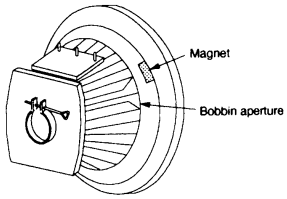
Adjustment purpose Correct convergence at the corners of the picture.

Symptom when incorrectly adjusted Color edging in the corners.

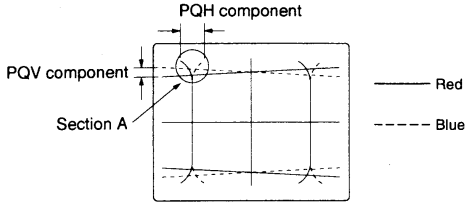
Input signal	VIDEO signal (crosshatch)
Input terminal	VIDEO IN terminal

1. Supply a VIDEO signal (crosshatch).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2".
4. Set the adjustment item to "BKG".
5. Set the adjustment data to "00".
6. If convergence is poor at the corners, place a magnet at the aperture of the deflection yoke bobbin as shown in the figure so that PQH (Pin cushion quality H) and PQV (Pin cushion quality V) components are minimized.
   To corret the A section of the screen, stick a magnet (Part No. 461D017O10) and Ferrite sheet (Part No. 479D002O10) in the postion shown in the figure below.





Magnet mounting position
(Rear view of deflection yoke)



(Misconversion pattern)

7. Re-set the adjustment data to "01".
8. Terminate the circuit adjustment mode. (Press "MENU" twice)

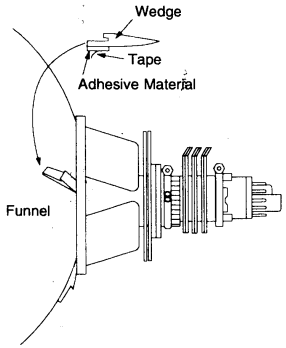
8. Wedges position

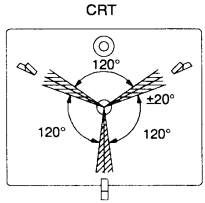
Adjustment purpose Fix the deflection yoke to the funnel of the CRT.

Symptom when incorrectly adjusted Convergence diverges.

Input signal	- - -
Input terminal	- - -

1. Insert 3 wedges so there is no yoke movement, as shown below.
2. After positioning the wedges, gently turn up the end of the wedge and strip the tape from the rear of the end to expose the adhesive material, then adhere to the funnel of the CRT.
3. Apply silicone gum (Part No. 859D106O20) between wedges and the funnel of the CRT.





Note: Do not use a wedge that has already been used.

ELECTRICAL ADJUSTMENTS

Perform only the alignments required.
If proper equipment is not available, do not attempt an alignment.

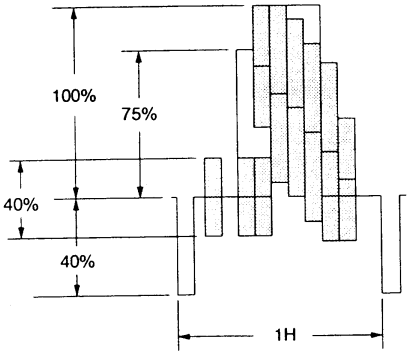
◘ Measuring equipment and Jigs

- Oscilloscope (Unless otherwise specified in particular, use 10:1 probes)
- Signal generator
- Frequency counter
- Direct current voltmeter
- Sweep generator
- Direct current power supply
- Multiplex audio signal generator
- Direct current milliampmeter
- Electrical tools
- Cable extension kit (Part No. 859C431O20)

◘ Test signal

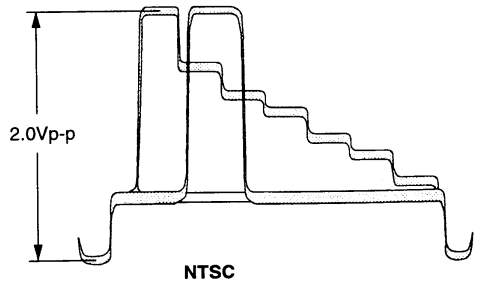
(1) Monoscope signal
When you have no monoscope signal source for adjustment, connect the unit to a VCR and play an alignment tape (Monoscope).

(2) Color bar signal
In this manual, unless otherwise specified in particular, use the color bar signal specified below.



NTSC
Split-Field Color Bars (with 100% window)

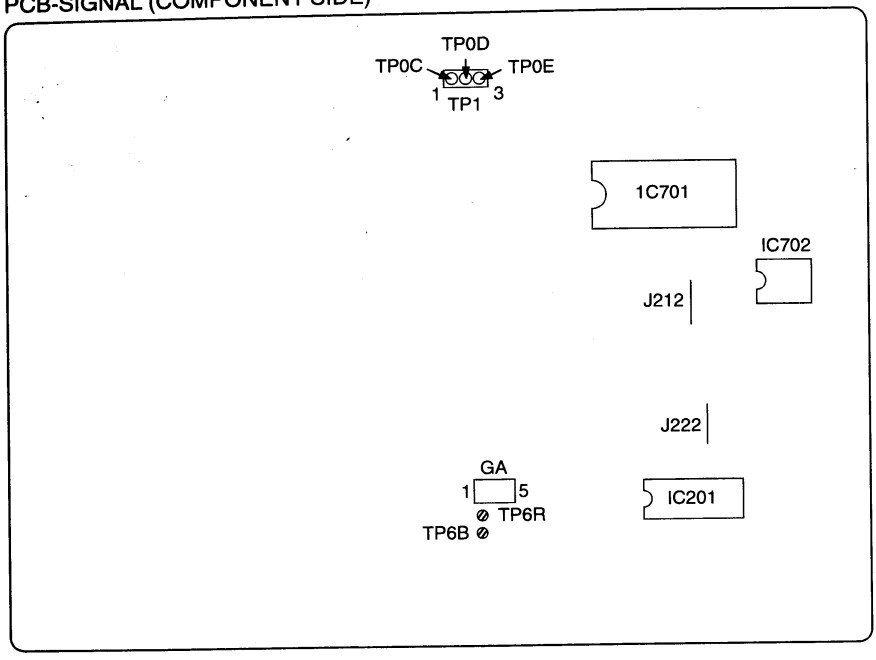
(3) Use the following signal for the adjustment of Item 25 (Sub CONT).
Signal: EIA color bar ..... Chroma off
2.0Vp-p (at no-load)
Sync chip-0.6Vp-p
Set up-0%.



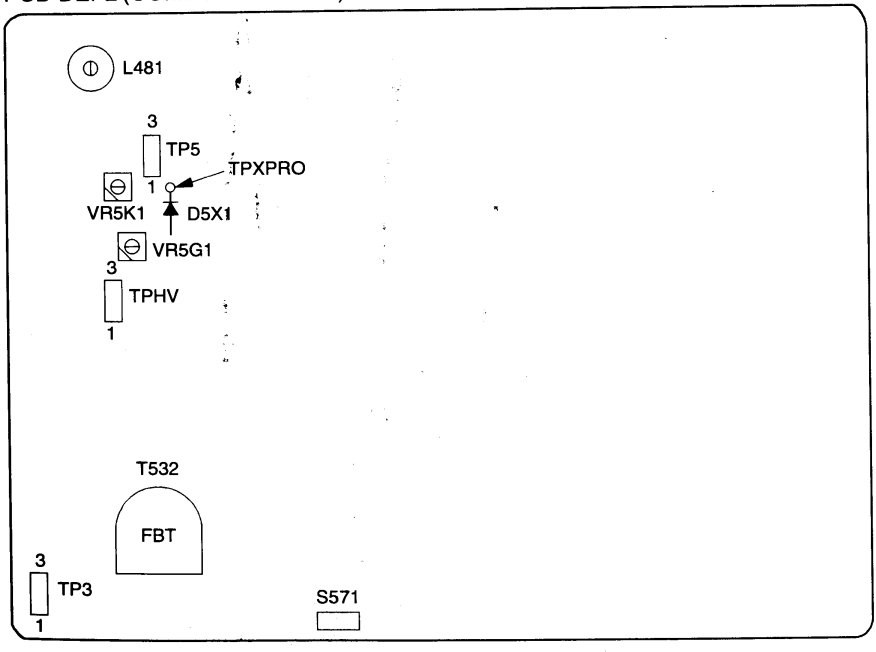
NTSC
EIA Color Bars (Chroma OFF)

LOCATION OF TEST POINTS AND ADJUSTMENTS

PCB-SIGNAL (COMPONENT SIDE)

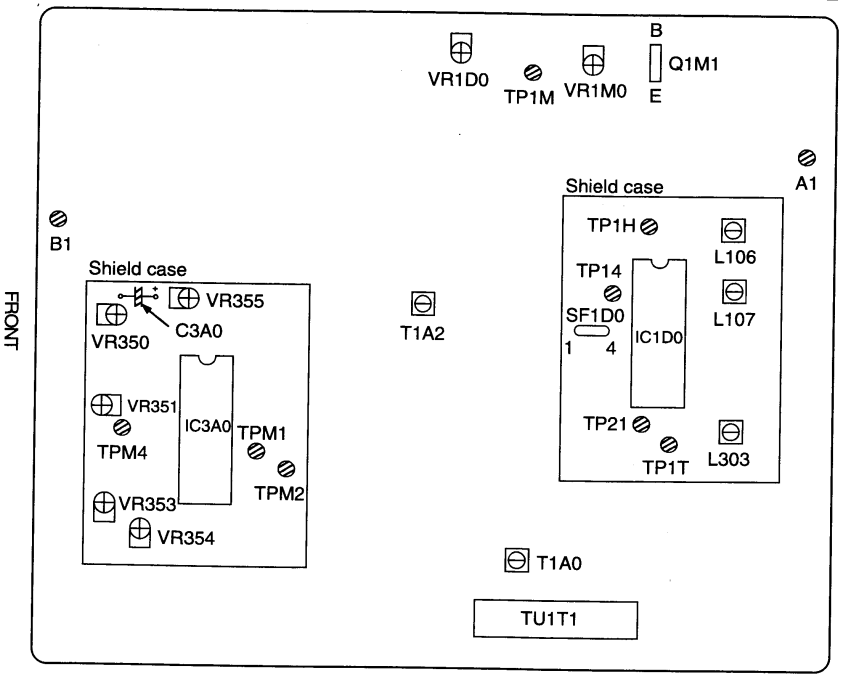


PCB-DEFL (COMPONENT SIDE)



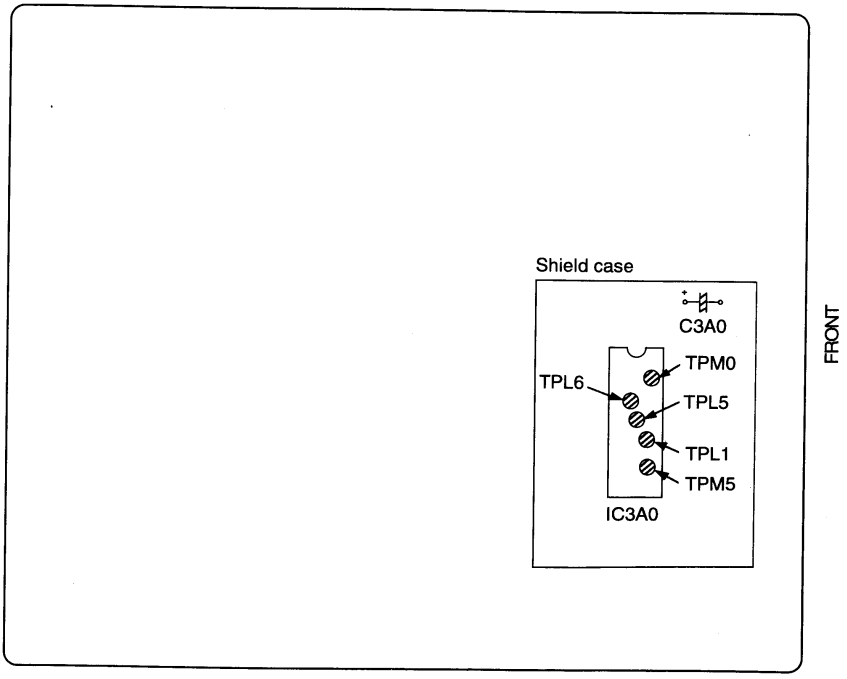
PCB-HF (COMPONENT SIDE)

△UP SIDE

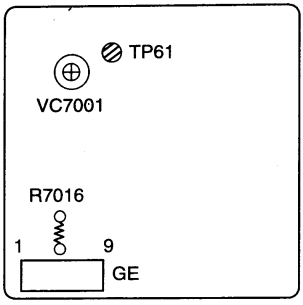


PCB-HF (SOLDER SIDE)

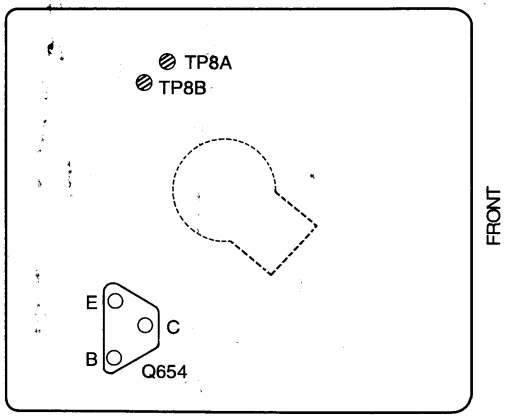
△UP SIDE



PCB-PIP (COMPONENT SIDE)



PCB-CRT (SOLDER SIDE)



Initial Set up

Follow the steps below for the initial set up.

1. Set the receiver to "TV mode".
2. Press the "MENU" button on a remote hand unit one time to select the "MENU" display.
3. Press the buttons "2", "3", "5" and "8" successively to select the "OPTION MENU" display.
4. Press the "ADJUST" button to select "Initial".
5. Press the "ENTER" button.

Note: At this time, channel 3 is selected.

6. Perform steps 2 and 3 above to display the "OPTION MENU" screen.
7. Use the "ADJUST" button and the "ENTER" button to set "OPTION MENU" as shown in the table below.
8. Press the "MENU" button twice to return to normal viewing.

OPTION MENU

Initial			
E2RESET		CCD	: On
Hotel	: Off	Auto clock	: On
		Call letr	: On
		Net name	: On
		Prog name	: On
		Prog descr	: On

CAUTION: DO NOT select "E2RESET" and press "ENTER".
If pressed, all the data of E^2PROM is changed to the initial data value, then readjustment of all the data relating to the E^2PROM must be performed.

Circuit Adjustment Mode

On this model, the following adjustment items may only be performed using the remote hand unit.

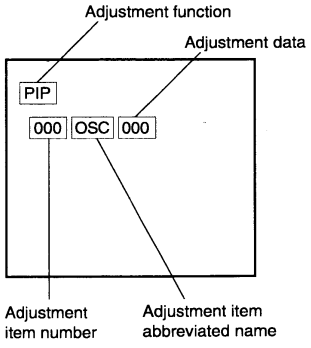
* Item 11 (white level) ~ Item 13 (Color output)
* Item 15 (Horizontal width, Vertical height, linearity) ~ Item 20 (Horizontal position)
* Item 22 (Vertical postion)
* Item 25 (Sub CONT) ~ Item 26 (Character position)
* Item 28 (Sub Picture chroma gain) ~ Item 29 (Sub TINT)

To perform these adjustments, use the following procedure to activate the circuit adjustment mode.

1. Activating the circuit adjustment mode

(1) Press the "MENU" button on a remote hand unit. (The "MENU" display will appear.)

(2) Press the buttons "2", "3", "5" and "7" in that order. (The screen will change to the circuit adjustment mode.)
If it has not changed to the circuit adjustment mode, repeat steps (1) and (2) again.

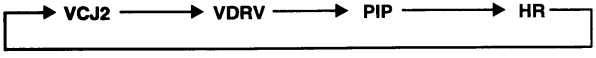


2. Selection of adjustment functions and adjustment items

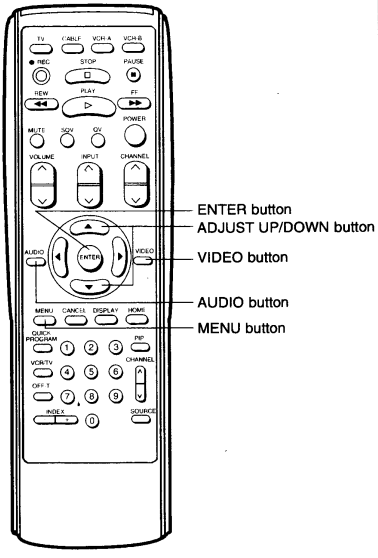
To select an adjustment item in the circuit adjustment mode, select first the adjustment function, that includes the specific adjustment item to be selected, and next select the adjustment item.

Refer to the following pages for the listing of adjustment functions and adjustment items.

(1) Press the "AUDIO" button on a remote hand unit to select an adjustment function. Each time the button is pressed, the adjustment function changes in the following sequence.



(2) Press the "VIDEO" button to select a specific adjustment item. The adjustment item number increases, each time the "VIDEO" button is pressed.



3. Changing Data

After selecting an adjustment item, use the "ADJUST UP/DOWN" button to change adjustment value.

*If "ADJUST DOWN" button is pressed, the adjustment data decreases.

*If "ADJUST UP" button is pressed, the adjustment data increases.

4. Saving of adjustment data

Press the "ENTER" button to save the adjustment data in memory. The display of characters goes red for approx. two seconds in this step.

Note: If the circuit adjustment mode is terminated without pressing the "ENTER" button, changes in adjustment data are not saved.

5. Terminating the circuit adjustment mode

Press the "MENU" button on the remote hand unit twice to terminate the circuit adjustment mode.

Note: The circuit adjustment mode can be also terminated by turning the power OFF.

List of Adjustment Functions and Adjustment Items

Note: The values with the description of "Fixed Value" in the NOTE column should not be changed.
Note: The "initial data" is the initial value of that adjustment. The initial data may not be correct for the normal performance of your specific TV set.
Note: The E²PROM stores the adjustment data. When replaced, the micro computer will automatically write the initial data values in the new E²PROM. Initial data with an * mark will differ from that given in the table.
After replacing E²PROM, or when selecting E2RESET in OPTION MENU, readjust the data with * marks to the value listed below.
Note: When ICs for specific adjustment functions are replaced, the micro computers automatically writes the data value and is stored in the E²PROM.

Function Display		VCJ2			IC201
Adjustment Item	Adjustment Item Abbreviated Name	Adjustment Name	Changeable Range	Initial Data	Note
0	DL1	DL Aperture Control 1	0~3	02	Fixed value
1	DL2	DL Aperture Control 2	0~3	*02	
2	YDL	DL Time Adj	0~3	*01	Fixed value
3	SHP	Sharpness	0~63	10	
4	CNT	Contrast Cont	0~127	45	
5	NRL	NR Corring Level	0~7	04	Fixed value
6	COL	Color Cont	0~127	55	
7	TNT	TINT Cont	0~127	65	
8	HPH	AFC Horizontal Phase	0~15	04	
9	GMA	γ-position	0~7	04	
10	BRT	Brightness Cont	0~127	48	
11	DMR	DRIVE (R)	0~63	32	
12	DMB	DRIVE (B)	0~63	32	
13	CTR	CUT OFF (R)	0~127	127	
14	CTG	CUT OFF (G)	0~127	127	
15	CTB	CUT OFF (B)	0~127	127	
16	BKR	BLK Select (R)	0~1	01	Fixed value
17	BKG	BLK Select (G)	0~1	01	Fixed value
18	BKB	BLK Select (B)	0~1	01	Fixed value
19	FLS	Flesh Cont on/off	1	01	Fixed value
20	DEM	Demodulation Axis	1	01	Fixed value
21	SVS	Service SW	0~1	01	
22	AFC	AFC1 Speed Changeover	0~1	01	
23	PED	Auto Pedestal on/off	0~1	00	Fixed value
24	YNR	YNR on/off	0~1	01	
25	DHR	Color Temperature High DRIVE (R)	0~63	32	
26	DHB	Color Temperature High DRIVE (B)	0~63	32	
27	DLR	Color Temperature Low DRIVE (R)	0~63	32	
28	DLB	Color Temperature Low DRIVE (B)	0~63	32	

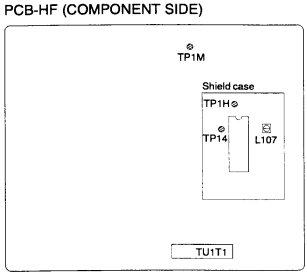
Function Display		VDRV			IC501
Adjustment Item	Adjustment Item Abbreviated Name	Adjustment Name	Changeable Range	Initial Data	Note
0	VHT	V-Height	0~63	28	
1	VLR	V-Linearity	0~31	25	
2	VSC	V-S Correction	0~31	06	
3	VSF	V-Shift	0~7	04	Fixed value
4	VCM	V-Compensation	0~15	11	
5	HWD	H-Width	0~63	32	
6	PAM	E-W Parabola (PCC-AMP)	0~63	25	
7	PCN	E-W Corner (PCC Corner)	0~15	13	
8	PPH	Trapezoidal PCC-Phase	0~63	20	
9	HCM	H-Compensation	0~15	13	
10	VSS	V-S Correction	0~15	11	
11	VPO	V-Position	0~2	01	

Function Display		PIP			IC7002
Adjustment Item	Adjustment Item Abbreviated Name	Adjustment Name	Changeable Range	Initial Data	Note
0	TINT	Tint	0~63	22	
1	COLR	Color Saturation	0~63	19	
2	DECD	Color Reset	0~1	0	Fixed value
3	SYNC	Sub Picture Sync Separation Threshold	0~7	* 1	Fixed value
4	RVS	RVS	0~1	0	Fixed value
5	BG-Y	Back Ground Luminance Level	0~15	8	Fixed value
6	BSTB	Burst with Background displayed	0~63	21	Fixed value
7	MVW	Sub Picture Macro Vision	0~3	* 3	Fixed value
8	CRTN	Sub Picture Tint Offset	0~3	1	Fixed value
9	VXA	Sub Picture Vertical Position	91~255	110	Fixed value
10	HXAO	Sub Picture Horizontal Positon	17~139	131	Fixed value
11	ADJ9	Delay Volume between Sub Picture and Frame (1/9)	0~15	* 4	Fixed value
12	YDL9	Sub Picture Y Delay Volume (1/9)	8~29	*16	Fixed value
13	HPX9	Writing System Horizontal Position (1/9)	0~255	*44	Fixed value
14	VYA9	Sub Picture Height (1/9)	0~255	188	Fixed value
15	HYA9	Sub Picture Width (1/9)	6~255	58	Fixed value
16	ADJ6	Delay Volume between Sub Picture and Frame (1/16)	0~15	* 4	Fixed value
17	YDL6	Sub Picture Y Delay Volume (1/16)	8~29	16	Fixed value
18	HPH6	Writing System Horizontal Position (1/16)	0~255	98	Fixed value
19	VYA6	Sub Picture Height (1/16)	0~255	206	Fixed value
20	HYA6	Sub Picture Width (1/16)	6~255	44	Fixed value
21	VXAM	Sub Picture Vertical Position (Multi)	207~255	228	Fixed value
22	HXAM	Sub Picture Horizontal Position (Multi)	15~150	32	Fixed value
23	VXBM	Sub Picture Vertical Position (Multi)	200~239	239	Fixed value

[IF Circuit] 1. VCO Free run frequency	**Adjustment purpose**	Setting VCO free run frequency to the picture IF frequency.
	Symptom when incorrectly adjusted	Impossible to tune channels properly.

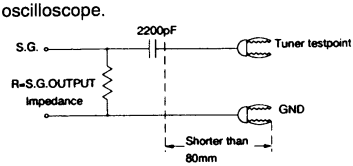
Measuring instrument	Oscilloscope
Test point	TP1M
EXT trigger	---
Measurement range	DIV 20mV TIM 2ms
Input signal	sweep signal (90±2dBμ/load)
Input terminal	Tuner testpoint

PCB-HF (COMPONENT SIDE)

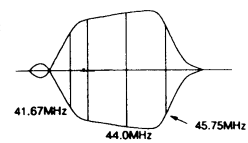


* Preheat the set for two minutes or more.

1. Remove the ANTENNA cable from RF IN terminal.
2. Select VHF-High band (CH11).
3. Connect TP1H to the ground via an electrolytic capacitor (22μF, 35V or more).
4. Connect a sweep generator to the tuner testpoint via the jig, as shown below. (Use the shield case of tuner unit for the ground.)
5. Connect a DC Power supply to TP14.
6. Adjust the voltage of TP14 so that the amplitude of the waveform on the oscilloscope is 1.2Vp-p.
7. Adjust L107 so that the zero beat point is aligned with 45.75MHz marker on the oscilloscope.



JIG



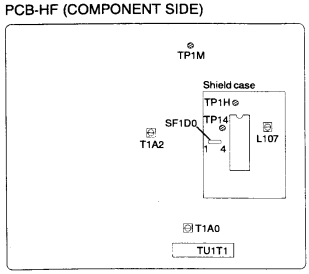
WAVEFORM

8. Remove the Power supply from TP14 and connect TP14 to the ground.
9. Remove the electrolytic capacitor from TP1H and the ground.
10. Measure the voltage on TP1H.
11. Open the short circuit between TP14 and ground.
12. Set the output of a generator to 45.75MHz sine wave.
13. Adjust L107 so that the voltage reading on TP1H is the value within ±30mV to the reading measured in step 10.

2. VIF Overall response	**Adjustment purpose**	Frequency characteristics of VIF detection circuit.
	Symptom when incorrectly adjusted	Too sharp or too soft picture.

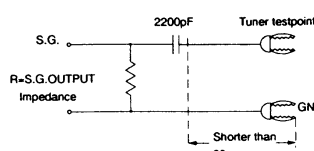
Measuring instrument	Oscilloscope
Test point	TP1M
EXT trigger	---
Measurement range	DIV 20mV TIM 2ms
Input signal	sweep signal (90±2dBμ/load)
Input terminal	Tuner testpoint

PCB-HF (COMPONENT SIDE)

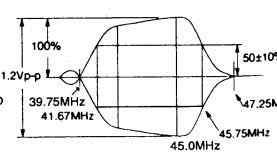


* This adjustment must follow Item 1 (VCO Free run frequency).

1. Remove the ANTENNA cable from RF IN terminal.
2. Select VHF-High band (CH11).
3. Connect a ceramic capacitor (50V, 2200pF) across pins 1 and 4 of SF1D0.
4. Connect TP1H to the ground via an electrolytic capacitor (22μF, 35V or more).
5. Connect a sweep generator to the tuner testpoint via jig, as shown below. (Use the shield case of tuner unit for the ground.)
6. Connect a DC Power supply to TP14.
7. Observe the waveform at TP1M.
8. Adjust the voltage of TP14 so that the amplitude of the waveform on the oscilloscope is 1.2Vp-p.
9. Adjust T1A0 to tune the trap frequency to 47.25MHz.
10. Adjust T1A2 to tune the trap frequency to 39.75MHz.
11. Remove the ceramic capacitor from pins 1 and 4 of SF1D0.
12. Adjust the IF coil in the tuner unit so that the amplitude at 41.67MHz and 45.75MHz are almost the same as shown below.



JIG



WAVEFORM

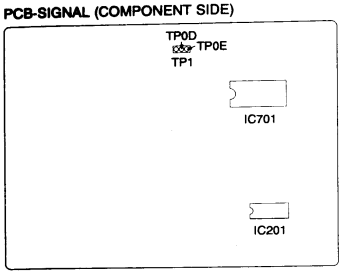
[AGC Circuit] 3. RF AGC	**Adjustment purpose**	Setting RF AGC to optimum point for RF reception.
	Symptom when incorrectly adjusted	Poor S/N ratio or cross modulation.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	RF signal (standard broadcast)
Input terminal	RF IN terminal

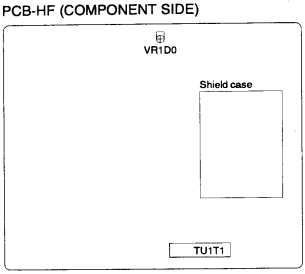
* This adjustment should be done when there is cross modulation or the picture tears horizontally.
* This adjustment must follow Item 1 (VCO Free run frequency).
1. Supply an RF signal (standard broadcast).
2. Short circuit TP0E and TP0D. (DISPLAYS MFT)
3. Adjust VR1D0 until the symptom disappears.
4. Open short-circuit between TP0E and TP0D.

Note: Adjustment Item 4 (AFT) must be performed immediately after this adjustment.

PCB-SIGNAL (COMPONENT SIDE)



PCB-HF (COMPONENT SIDE)



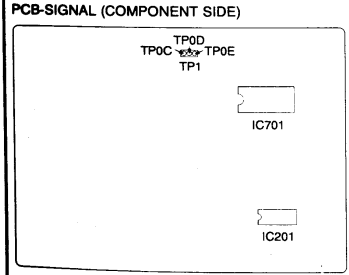
4. AFT	**Adjustment purpose**	Align AFT circuit.
	Symptom when incorrectly adjusted	Channel(s) detuned.

Measuring instrument	DC voltmeter
Test point	TP0C
EXT trigger	---
Measurement range	---
Input signal	RF signal (color bar 70~80dBμ)
Input terminal	RF IN terminal

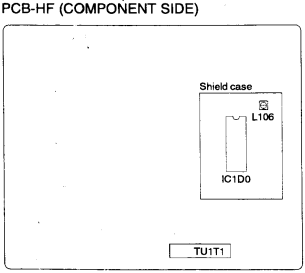
* This adjustment must follow Item 3 (RF AGC).
1. Supply an RF signal (color bar 70~80dBμ).
2. Set the receiver to TV mode.
3. Short-circuit TP0E and TP0D. (DISPLAYS MFT)
4. Observe the DC voltage at TP0C.
5. Adjust L106 so that the DC voltmeter reads DC 2.8±0.1V.
6. Open short-circuit between TP0E and TP0D.

Note: Adjustment Item 5 (Video level) must be performed immediately after this adjustment.

PCB-SIGNAL (COMPONENT SIDE)



PCB-HF (COMPONENT SIDE)



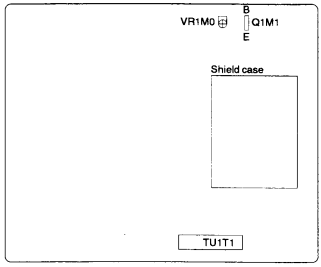
5. Video level	**Adjustment purpose**	Setting tuner video level.
	Symptom when incorrectly adjusted	Too bright or too dark picture when receiving broadcast programs.

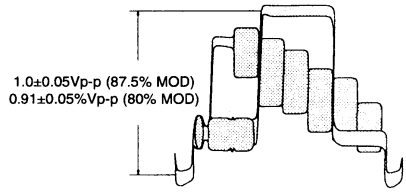
Measuring instrument	Oscilloscope
Test point	Emitter of Q1M1
EXT trigger	---
Measurement range	DIV 20mV TIM 10μs
Input signal	RF signal (color bar)
Input terminal	RF IN terminal

* This adjustment must follow Item 4 (AFT).

1. Supply an RF signal (color bar).
2. Observe the waveform at emitter of Q1M1.
3. Adjust VR1M0 so that the amplitude of the waveform is 1.0±0.05Vp-p(87.5%MOD) or 0.91±0.05Vp-p (80.0%MOD).

PCB-HF (COMPONENT SIDE)





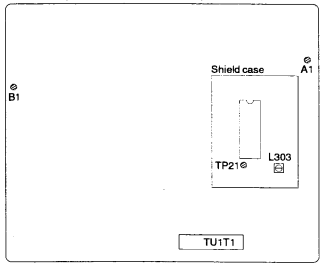
WAVEFORM

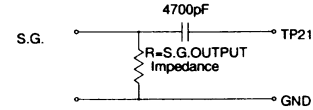
[Audio Circuit] 6. FM Multiplex audio detect	**Adjustment purpose**	To obtain OPTIMUM demodulation of the FM signal.
	Symptom when incorrectly adjusted	Distorted sound or no SAP detection.

Measuring instrument	DC voltmeter
Test point	TP20 (A1 or B1)
EXT trigger	---
Measurement range	---
Input signal	Sinewave signal (4.5MHz,90dBμ)
Input terminal	TP21

1. Connect a signal generator (0%MOD) to TP21 using a high pass filter, as shown below.
2. Observe the DC voltage at TP20 (A1 or B1).
3. Adjust L303 so that a DC voltmeter reads DC4.5±0.1 V.

PCB-HF (COMPONENT SIDE)





High pass filter

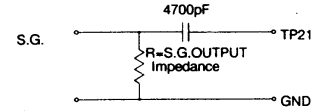
7. Composite level

Adjustment purpose Setting input level of audio detection signal to normal.

Symptom when incorrectly adjusted Varying output level or malfunction of STEREO mode display.

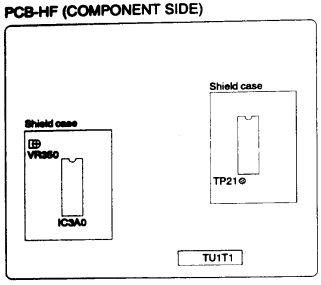
Measuring instrument	Oscilloscope
Test point	TPM0
EXT trigger	---
Measurement range	DIV 20mV TIM 1ms
Input signal	FM signal (4.5MHz,90dBμ)
Input terminal	TP21

1. Supply an FM modulated signal (400Hz, 100%MOD) to TP21 using a high pass filter, as shown below.
2. Observe the waveform at TPM0.
3. Adjust VR350 so that the amplitude of the waveform on the oscilloscope is 850±20mVp-p.

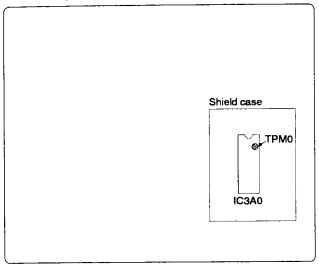


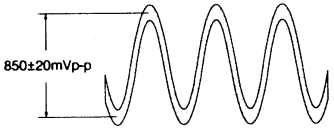
High pass filter

PCB-HF (COMPONENT SIDE)



PCB-HF (SOLDER SIDE)





WAVEFORM

8. Stereo VCO

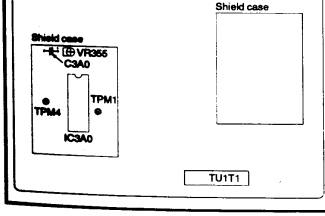
Adjustment purpose Set the reference frequency for the multiplex IC oscillator.

Symptom when incorrectly adjusted No STEREO mode detection.

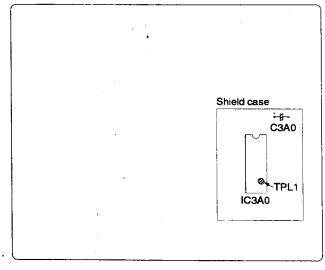
Measuring instrument	Frequency counter
Test point	TPM1
EXT trigger	---
Measurement range	---
Input signal	---
Input terminal	---

1. Connect TPL1 (pin 10 of IC3A0) to TPM4 (pin 12 of IC3A0) via a resistor (1/4W 100kΩ).
2. Connect the (+) lead of C3A0 to ground via electrolytic capacitor (2200μF, 16V or more).
3. Observe the frequency at TPM1.
4. Adjust VR355 for 15.73±0.05kHz reading on the frequency counter.
5. Remove the resistor from TPL1 and TPM4, and remove the electrolytic capacitor from C3A0.

PCB-HF (COMPONENT SIDE)



PCB-HF (SOLDER SIDE)



9. Filter

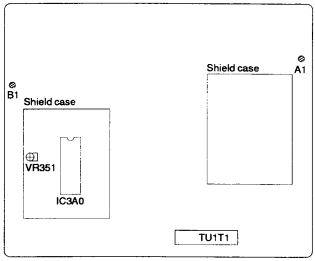
Adjustment purpose Filter for pilot signal.

Symptom when incorrectly adjusted Poor S/N ratio of signal for STEREO or SAP mode.

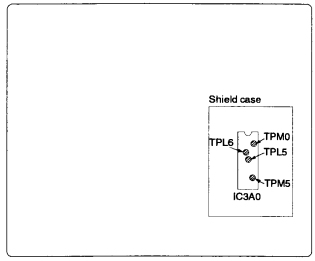
Measuring instrument	Oscilloscope
Test point	TPM5 (pin 17 of IC301)
EXT trigger	---
Measurement range	DIV 10mV TIM 50µs
Input signal	Sinewave signal (15.73kHz,100mVrms)
Input terminal	TPM0

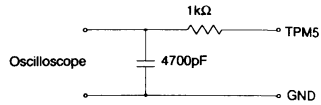
1. Connect TP20 (A1 or B1) to ground via an electrolytic capacitor (1000µf, 16V or more).
2. Short-circuit TPL5 and TPL6.
3. Set the signal generator output to 15.73kHz, 100mVrms sine wave and connect to TPM0 via an electrolytic capacitor (10µF, 50V or more) as shown below.
4. Observe the waveform at TPM5 using a low pass filter as shown below.
5. Adjust VR351 so that the amplitude of the waveform on the oscilloscope is minimum.
6. Remove the electrolytic capacitor from TP20 (A1 or B1) and the ground.
7. Open short-circuit between TPL5 and TPL6.

PCB-HF (COMPONENT SIDE)

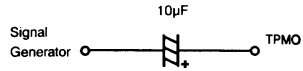


PCB-HF (SOLDER SIDE)





Low pass filter



Electrolytic capacitor

10. Separation and Spectral

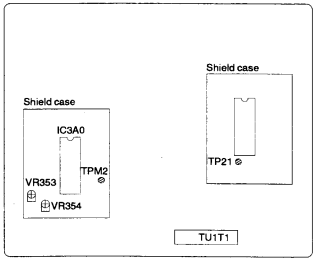
Adjustment purpose Adjust right and left separation.

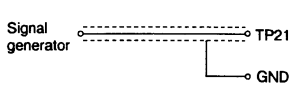
Symptom when incorrectly adjusted Poor or no stereo separation.

Measuring instrument	Oscilloscope
Test point	TPM2
EXT trigger	---
Measurement range	DIV 10mV TIM 2ms
Input signal	RF signal (multiplex audio)
Input terminal	TP21

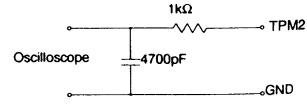
1. Set a multiplex audio signal generator to L-CH only, NR ON, PILOT ON, SAP OUT OFF, TELEMETRY OUT OFF with modulation at 300Hz, -11dBm.
2. Set an RF modulator to MONO, NR OFF, PILOT OFF, SAP OUT OFF, TELEMETRY OUT OFF, and set to AUDIO mode with 25kHz deviation.
3. Set the output level of an RF modulator to 0dBm.
4. Observe the waveform at TPM2 using a low pass filter, as shown below.
5. Adjust VR353 so that an amplitude of the waveform (300Hz) on the oscilloscope is minimum.
6. Change the modulating signal from 300Hz to 3kHz.
7. Adjust VR354 so that an amplitude of the waveform (3kHz) on the oscilloscope is minimum.
8. Repeat the above steps once more.

PCB-HF (COMPONENT SIDE)





Coaxial cable



Low pass filter

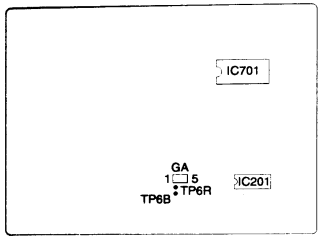
[Chroma Circuit]
11. White level

Adjustment purpose White level of picture.

Symptom when incorrectly adjusted Too bright or too dark white areas of the picture.

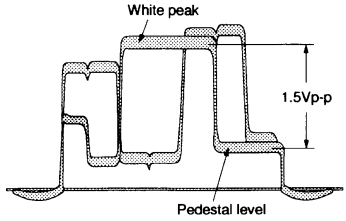
Measuring instrument	Oscilloscope
Test point	TP6R (pin 2 of connector GA)
EXT trigger	---
Measurement range	DIV 0.1V TIM 10µs
Input signal	VIDEO signal (color bar)
Input terminal	VIDEO IN terminal

PCB-SIGNAL (COMPONENT SIDE)



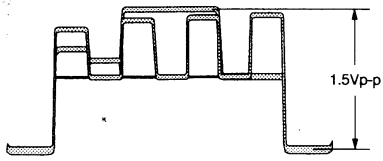
1. Supply a VIDEO signal (color bar).
2. Activate the circuit adjustment mode. (refer to page 19).
3. Set the adjustment function to VCJ2. ("AUDIO" button)
4. Set the adjustment data of the adjustment items "DMR", "DMB", "CTR", "CTG" and "CTB" to the initial data. ("ADJUST" button - press "ENTER" after each setting)
5. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
6. Set the adjustment data to "07". ("ADJUST" button)
7. Connect an oscilloscope to TP6R.
8. Set the adjustment item to "CNT" (Contrast). ("VIDEO" button)
9. Set the adjustment data so that the waveform on the oscilloscope matches waveform (A) below. ("ADJUST" button)

Adjusment item	Initial data
DMR	32
DMB	32
CTR	127
CTG	127
CTB	127



Waveform (A)

10. Connect an oscilloscope to TP6B.
11. Set the adjustment item to "DHB" (B-DRIVE). ("VIDEO" button)
12. Set the adjustment data so that the waveform on the oscilloscope matches waveform (B) below. ("ADJUST" button)



Waveform (B)

13. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
14. Set the adjustment data to "04". ("ADJUST" button)
15. Write the adjustment data. (Press "ENTER")
16. Terminate the circuit adjustment mode. (Press "MENU" twice)

Note: Adjustment Item 12 (Vector) must be performed immediately after this adjustment.

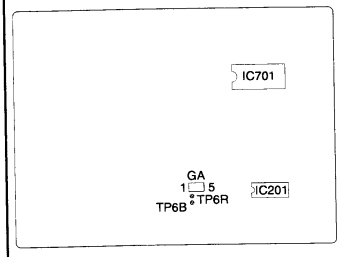
12. Vector

Adjustment purpose To produce correct hues.

Symptom when incorrectly adjusted Different hue between main picture and sub picture.

Measuring instrument	Oscilloscope
Test point	CH-1: TP6B CH-2: TP6R
EXT trigger	---
Measurement range	DIV 0.1V X-Y mode
Input signal	VIDEO signal (color bar, Y signal OFF)
Input terminal	VIDEO IN terminal

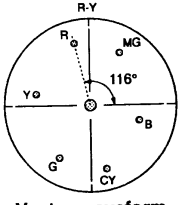
PCB-SIGNAL (COMPONENT SIDE)



* This adjustment must follow Item 11 (White level).

1. Supply a VIDEO signal (color bar, Y signal OFF).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2". ("AUDIO" button)
4. Set the data of the adjustment items "DMR", "DMB", "CTR", "CTG", and "CTB" to the initial data. ("ADJUST" button - press "ENTER" after each setting)
5. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
6. Set the adjustment data to "07". ("ADJUST" button)
7. Observe the waveform at TP6B and TP6R (CH-1 to TP6B).
8. Set the adjustment item to "TNT" (TINT). ("VIDEO" button)
9. Set the adjustment data so that the luminance point showing red in the vector waveform is placed at 116 degrees. ("ADJUST" button)
10. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
11. Set the adjustment data to "04". ("ADJUST" button)
12. Write the adjustment data. (Press "ENTER")
13. Terminate the circuit adjustment mode. (Press "MENU" twice)

Note: Adjustment Item 13 (Color output) must be performed immediately after this adjustment.



Vector waveform

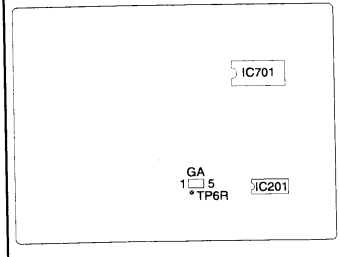
13. Color output

Adjustment purpose Color level of picture.

Symptom when incorrectly adjusted Excess or insufficient color.

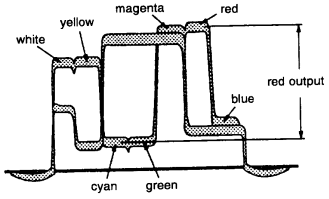
Measuring instrument	Oscilloscope
Test point	TP6R
EXT trigger	---
Measurement range	DIV 50mV TIM 10μs
Input signal	VIDEO signal (color bar)
Input terminal	VIDEO IN terminal

PCB-SIGNAL (COMPONENT SIDE)



* This adjustment must follow Item 12 (Vector).

1. Supply a VIDEO signal (color bar).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2". ("AUDIO" button)
4. Set the data of the adjustment items "DMR", "DMB", "CTR", "CTG", and "CTB" to the initial data. ("ADJUST" button - press "ENTER" after each setting)
5. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
6. Set the adjustment data to "07". ("ADJUST" button)
7. Set an oscilloscope in a normal mode and observe TP6R.
8. Set the adjustment item to "COL" (COLOR CONT). ("VIDEO" button)
9. Set the adjustment data so that the amplitude of the red output voltage waveform is 2.00±0.05Vp-p. (The data set must be equal or approximate to the initial data.) ("ADJUST" button)
10. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
11. Set the adjustment data to "04". ("ADJUST" button)
12. Write the adjustment data. (Press "ENTER")
13. Terminate the circuit adjustment mode. (Press "MENU" twice)

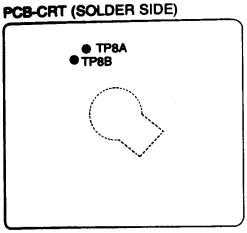


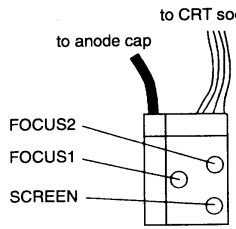
Waveform

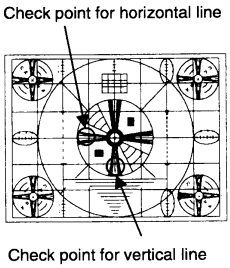
[CRT Circuit] 14. Focus	**Adjustment purpose**	Sharpness of picture.
	Symptom when incorrectly adjusted	Poor sharpness of picture.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

1. Supply a VIDEO signal (monoscope).
2. Short-circuit TP8A and TP8B.
3. Observe the vertical line, adjust FOCUS-2 control for best focus.
4. Observe the horizontal line, adjust FOCUS-1 control for best focus.
5. Repeat step 2 and 3 three times or more until no further improvement is seen.
6. Open short-circuit between TP8A and TP8B.







Monoscope Signal

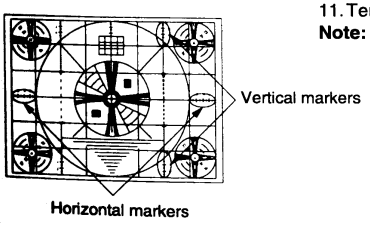
[Deflection Circuit] 15. Horizontal width, Vertical height, linearity	**Adjustment purpose**	Horizontal and vertical balance of picture.
	Symptom when incorrectly adjusted	Horizontally or vertically compressed or expanded picture.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

* This adjustment must follow Item 14 (Focus).

1. Supply a VIDEO signal (monoscope).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VDRV". ("AUDIO" button)
4. Set the adjustment item to "HWD" (Horizontal width). ("VIDEO" button)
5. Set the adjustment data so that the sum of the markers of the horizontal width is 7.0. ("ADJUST" button, then press "ENTER")
6. Set the adjustment item to "VLR" (Vertical linearity). ("VIDEO" button)
7. Set the adjustment data so that the vertical linearity is optimum. ("ADJUST" button, then press "ENTER")
8. Set the adjustment item to "VHT" (Vertical height). ("VIDEO" button)
9. Set the adjustment data so that the sum of the markers of the vertical height is 4.0. ("ADJUST" button)
10. Write the adjustment data. (Press "ENTER" after each adjustment)
11. Terminate the circuit adjustment mode. (Press "MENU" twice)

Note: Adjustment Item 16 (Side PCC) must be performed immediately after this adjustment.



Monoscope Signal

16. Side PCC	**Adjustment purpose**	Minimize side pincushion distortion.
	Symptom when incorrectly adjusted	Horizontal distortion of picture.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (crosshatch)
Input terminal	VIDEO IN terminal

* This adjustment must follow Item 15 (Horizontal width, Vertical height and Vertical linearity).

1. Supply a VIDEO signal (crosshatch).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VDRV". ("VIDEO" button)
4. Set the adjustment item to "PAM" (PCC-AMP). ("VIDEO" button)
5. Set the adjustment data so that the side raster distortion is minimum.
6. Set the adjustment item to "PPH" (PCC-Phase). ("VIDEO" button)
7. Set the adjustment data so that the side raster distortion is minimum.
8. Write the adjustment data. (Press "ENTER" after each adjustment)
9. Terminate the circuit adjustment mode. (Press "MENU" twice)

Note: Repeat step 4 and 7 above alternately to make the side raster distortion minimum.

Note: If the side raster distortion is large in the middle, set the adjustment item to "PCN" and set the adjustment data so that the distortion is not noticeable.

Note: Adjustment Item 17 (CRT bias, Cut off) must be performed immediately after this adjustment.

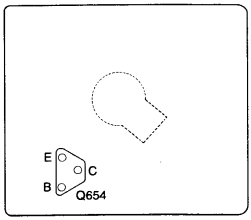
[CRT Circuit] 17. CRT bias, Cut off	**Adjustment purpose**	Setting the cut off level of the three electron beams.
	Symptom when incorrectly adjusted	Monochrome has a color tint.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

* This adjustment must follow Item 16 (Side PCC).

1. Supply a VIDEO signal (monoscope).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2". ("AUDIO" button)
4. Set the data of the adjustment items "CNT", "BRT", "DHR", "DHB", "DLR" and "DLB" to the initial data. ("VIDEO", "ADJUST" and "ENTER" buttons)
5. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
6. Set the adjustment data to "07". ("ADJUST" button)
7. Set the adjustment item to "APL" (APL Circuit Connection Amount). ("VIDEO" button)
8. Set the adjustment data to "06". ("ADJUST" button)

PCB-CRT (SOLDER SIDE)



Adjusment item	Initial data
CNT	45
BRT	48
DHR	32
DHB	32
DLR	32
DLB	32

Continued on next page

9. Set the adjustment item to "SVS" (Single Horizontal Line Switchover). ("VIDEO" button)
10. Set the adjustment data to "00". (The screen will be changed to display a single horizontal line.) ("ADJUST" button)
11. Set the SCREEN VR on FBT (T532) to the point where one red, green, or blue line just becomes visible.
12. Set the adjustment data to "01". (The screen will return to the normal display.) ("ADJUST" button)
13. Decrease the value for the adjustment items "CTR", "CTG" and "CTB" for the colors not visible on the screen when displaying the single horizontal line in step 5 above, to set the horizontal line color to white. ("VIDEO", "ADJUST" and "ENTER" buttons)
14. Set the adjustment item to "GMA" (γ-Position). ("VIDEO" button)
15. Set the adjustment data to "04" ("ADJUST" button)
16. Write the adjustment data. (Press "ENTER")
17. Terminate the circuit adjustment mode. (Press "MENU" twice)

Note: The screen displays the single white line for a certain amount of time after the adjustment data is modified. (While adjusting the screen goes to a single horizontal line.)

Note: CUT OFF data of the color visible on the screen displaying the single line in step 11 must not be changed.

Note: Adjustment Item 18 (Black level) must be performed immediately after this adjustment.

18. Black level

Adjustment purpose Picture luminance.

Symptom when incorrectly adjusted Too bright or too dark a picture.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

* This adjustment must follow Item 17 (CRT bias, Cut off).

1. Supply a VIDEO signal (monoscope).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2". ("AUDIO" button)
4. Set the data of the adjustment items "DHR", "DHB", "DLR" and "DLB" to the initial data. ("VIDEO", "ADJUST" and "ENTER" buttons)
5. Set the adjustment item to "BRT" (BRIGHT CONT). ("VIDEO" button)
6. Observe a gradation signal inside a monoscope signal, and set the adjustment data so that the levels of 10% and 0% areas of the gradation signal shown below in the figure are equal (Black level 10%). ("ADJUST" button)

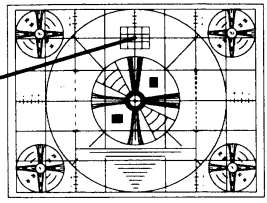
Note: In setting the black level to 10%, if the adjustment data of the item "BRT" varies exceeding ±2 from the value set in Item 17 (CRT bias, Cut off), adjust minutely the black level with "BRT" data after re-adjusting the screen VR.

7. Write the adjustment data. (Press "ENTER")
8. Terminate the circuit adjustment mode. (Press "MENU" twice)

Note: Adjustment Item 19 (White balance) must be performed immediately after this adjustment.

gradation signal

40%	30%	20%	10%
50%	0%	0%	0%
60%	70%	80%	90%



Monoscope signal

19. White balance	**Adjustment purpose**	The best white balance of picture.
	Symptom when incorrectly adjusted	Colored monochrome picture.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (white raster)
Input terminal	VIDEO IN terminal

* This adjustment must follow Item 18 (Black level).

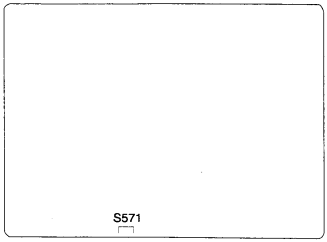
1. Supply a white raster signal.
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2". ("AUDIO" button)
4. Set the data of the adjustment item "DMR" (R-DRIVE) and "DMB" (B-DRIVE). ("VIDEO" button)
5. Set the adjustment data so that the color of a white raster signal appears white. ("ADJUST" button)
6. Set the adjustment item to "SVS" (Single Horizontal Line Switchover). ("VIDEO" button)
7. Set the adjustment data to "00". (The screen will be changed to display a single horizontal line.) ("ADJUST" button)
8. Make sure that the color of the horizontal line is white. If not white, repeat the adjustment in Item 17 (CRT bias, Cut off) again to make adjustment.
9. Write the adjustment data. (Press "ENTER")
10. Terminate the circuit adjustment mode. (Press "MENU" twice)

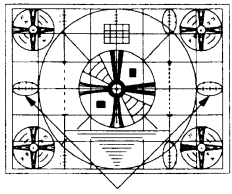
[Deflection circuit] 20. Horizontal position	**Adjustment purpose**	To set the horizontal position of the picture on screen.
	Symptom when incorrectly adjusted	Picture shifted to the left or the right.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

1. Supply a VIDEO signal (monoscope).
2. Set S571 so that the readings of the left and right markers are nearly the same.
3. Activate the circuit adjustment mode. (refer to page 19)
4. Set the adjustment function to "VCJ2". ("AUDIO" button)
5. Select adjustment item "HPH". ("VIDEO" button)
6. Set the adjustment data so the left and right markers are the same. ("ADJUST" button)
7. Write the adjustment data into memory. (Press "ENTER")
8. Terminate the circuit adjustment mode. (Press "MENU" twice)

PCB-DEFL (COMPONENT SIDE)





Horizontal markers

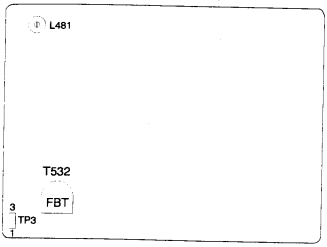
20. Top and Bottom PCC

Adjustment purpose Minimize top and bottom pincushion distortion.

Symptom when incorrectly adjusted Top and bottom of picture bowed.

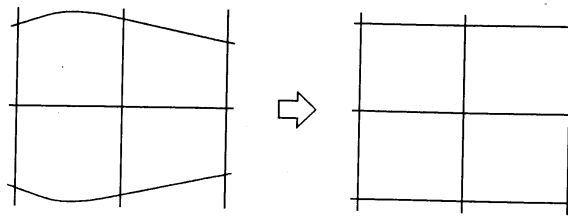
Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (crosshatch)
Input terminal	VIDEO IN terminal

PCB-DEFL (COMPONENT SIDE)



* Use a nonmetallic adjustment tool.

1. Supply a video signal (crosshatch).
2. Observe the bowing at the top and bottom of the crosshatch signal. Adjust L481 so that the raster distortion is minimum.



Bowing at top and bottom.

Normal (After adjustment) Minimum bowing.

Crosshatch signal

22. Vertical position

Adjustment purpose Vertical height and picture position.

Symptom when incorrectly adjusted Vertically expanded or compressed picture, or improper picture position.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

1. Supply a video signal (monoscope).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VDRV". ("AUDIO" button)
4. Set the adjustment item to "VPO" (V-Position). ("VIDEO" button)
5. Adjust data of item "VPO" so that the vertical position becomes optimum. ("ADJUST" button)

23. High voltage rectifying

Adjustment purpose - CRT anode voltage.

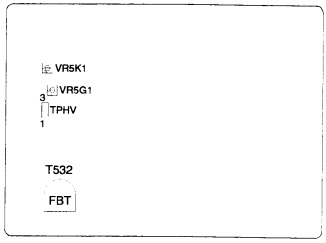
Symptom when incorrectly adjusted Too dark picture or X-ray protector operating abnormally.

Measuring instrument	DC voltmeter
Test point	TPHV
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

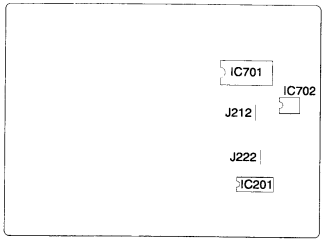
* Preheat the set for five minutes or more.

1. Supply a VIDEO signal (monoscope).
2. Turn VR5K1 fully clockwise.
3. Short-circuit J212 and J222 to make the picture a single horizontal line.
4. Set SCREEN VR on FBT (T532) to the point where one red, green or blue line becomes just visible.
5. Observe the voltage between pins 2 and 3 of TPHV. (+ lead to pin 2)
6. Adjust VR5G1 so that the reading of a DC voltmeter becomes 19.55±0.04V.
7. Open short-circuit between J212 and J222.
8. Repeat the adjustment in item 15 (Horizontal width and Vertical height, linearity) after this adjustment.
9. Adjustment Item 17 (CRT bias, Cut off) and Item 24 (X-ray protector) must be performed immediately after this adjustment.

PCB-DEFL (COMPONENT SIDE)



PCB-SIGNAL (COMPONENT SIDE)



24. X-ray protector

Adjustment purpose To set the maximum allowable HV sample in the protect circuit.

Symptom when incorrectly adjusted Premature X-Protect activation/Excess radiation.

Measuring instrument	DC voltmeter
Test point	+lead:pin 2 of TP5 -lead:pin 1 of TP5
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (monoscope)
Input terminal	VIDEO IN terminal

* This adjustment must follow Item 23 (High voltage rectifying).

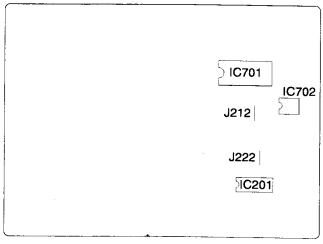
1. Supply a VIDEO signal (monoscope).
2. Short-circuit J212 and J222 to make the picture a single horizontal line.
3. Connect a DC voltmeter between pin 1 and pin 2 of TP5 (+ lead to pin 2 of TP5).
4. Adjust VR5K1 so that the reading of a DC voltmeter becomes 0.73 ±0.02V.
5. Connect a DC voltmeter to TPXPRO (cathode of D5X1) and ground.
6. Make sure that the reading on the DC voltmeter is equal to, or less than the values shown in A in Table below. (DC voltmeter: Imput impedance 1 MΩ or more, accuracy class 0.5 or more)

Note: If the voltmeter value exceeds the values shown in A of Table, re-adjust VR5G1 so that the voltmeter value is equal to the values shown in B in Table, before repeating step 3 and 4.

A	33.60 ±0.05V
B	33.50 ±0.05V

Table

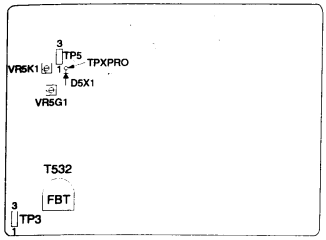
PCB-SIGNAL (COMPONENT SIDE)



7. Open short-circuit J212 and J222.
8. Lock VR5K1 by melting the plastic with the tip of a soldering iron.

Note: Adjustment Item 25 (Sub CONT) must be performed immediately after this adjustment.

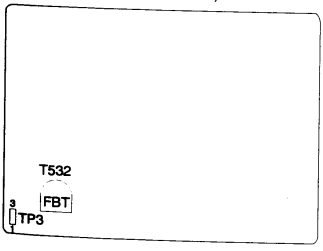
PCB-DEFL (COMPONENT SIDE)



[Video Circuit] 25. Sub CONT	**Adjustment purpose**	To set beam current to its optimum value.
	Symptom when incorrectly adjusted	Too bright or dark picture.

Measuring instrument	DC milliampmeter
Test point	+lead:pin 1 of TP3 -lead:pin 3 of TP3
EXT trigger	---
Measurement range	---
Input signal	shown in Table 1
Input terminal	VIDEO IN or RF IN terminal

PCB-DEFL (COMPONENT SIDE)



* This adjustment must follow Item 24 (X-ray protector).
* Preheat the set for two minutes or more.
* Use an EIA color bar signal, chroma off or standard color bar (87.5% MOD.) signal, chroma off by test signal item 3, for this adjustment.

1. Supply a VIDEO signal or an RF signal (shown in Table 1).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "VCJ2". ("AUDIO" button)
4. Set the adjustment item to "GMA" (γ-Positon). ("VIDEO" button)
5. Set the adjustment data to "07". ("ADJUST" button)
6. Connect a DC milliampmeter between pins 1 and 3 of TP3. (+ to pin 1)
7. Set the adjustment item to "CNT" (CONTRAST). ("VIDEO" button)
8. Set the adjustment data so that the indicated value of the DC milliampmeter is the same as Table 2. ("ADJUST" button and press "ENTER")
9. Set the adjustment item to "GMA (γ-Position). ("VIDEO" button)
10. Set the adjustment data to "04". ("ADJUST" button)
11. Write the adjustment data. (Press "ENTER")
12. Terminate the circuit adjustment mode. (Press "MENU" twice)

VIDEO signal
EIA color bar • • • • • • Chroma off
2.0Vp-p (at no load)
Sync amplitude-0.6Vp-p
Set up-0%

RF signal
Standard color bar • • Chroma off
1 Vp-p (at 75Ω load)
87.5% MOD

Table 1 Input signal

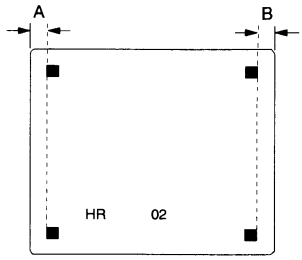
EIA color bar signal, Chroma off	Standard color bar (87.5% MOD.) signal, Chroma off
3300 ±100μA	4200 ±100μA

Table 2

[Screen character circuit] 26. Character position	**Adjustment purpose**	To position the character display.
	Symptom when incorrectly adjusted	Incorrect character position.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	RF signal (standard broadcast)
Input terminal	RF IN terminal

1. Supply an RF signal (standard broadcast).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "HR". ("AUDIO" button)
4. Adjust the adjustment data so that spaces A and B are the same width. ("ADJUST" button)
5. Write the adjustment data into memory. (Press "ENTER")
6. Terminate the circuit adjustment mode. (Press "MENU" twice)

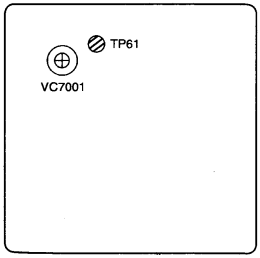


[PIP Circuit] 27. PIP fsc	**Adjustment purpose**	Set the clock frequency for PIP.
	Symptom when incorrectly adjusted	Disturbance or no color in the sub picture.

Measuring instrument	Frequency counter
Test point	TP61
EXT trigger	---
Measurement range	---
Input signal	RF signal (standard broadcast)
Input terminal	RF IN terminal

1. Supply an RF signal (standard broadcast).
2. Display standard contrast on the sub picture screen. Supply no signal for the main screen.
3. Observe the frequency at TP61.
4. Adjust VC7001 so that the frequency is 3.579545±0.000100MHz.

PCB-PIP (COMPONENT SIDE)



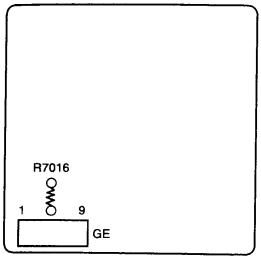
[PIP Circuit] 28. PIP chroma gain	**Adjustment purpose**	To set the color level between main and sub picture.
	Symptom when incorrectly adjusted	Different color level between main and sub picture.

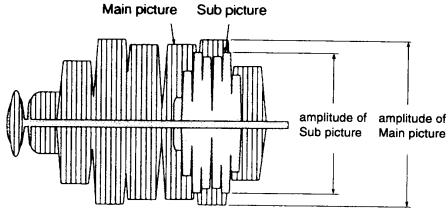
Measuring instrument	Oscilloscope
Test point	pin 7 of connector GE
EXT trigger	---
Measurement range	DIV 20mV TIM 10μs
Input signal	VIDEO signal (color bar)
Input terminal	VIDEO IN terminal

* Preheat the set for one minute or more.
1. Supply a VIDEO signal (color bar).
2. Activate the circuit adjustment mode. (refer to page 19)
3. Set the adjustment function to "PIP". ("AUDIO" button)
4. Set all the items in adjustment function "PIP" to the initial data value (refer to page 21). ("VIDEO" and "ADJUST" buttons)
5. Observe the waveform at pin 7 of connector GE (GE side of R7016).
6. Select adjustment item "1 COLR". ("VIDEO" button)
7. Set the adjustment data so that the amplitude of the waveforms of the main and sub pictures are equal. ("ADJUST" button)
8. Write the adjustment data into memory. (Press "ENTER")
9. Terminate the circuit adjustment mode. (Press "MENU" twice)

Note: Adjustment Item 29 (PIP Sub TINT) must be performed immediately after this adjustment.

PCB-PIP (COMPONENT SIDE)





[PIP Circuit] 29. PIP Sub TINT	**Adjustment purpose**	To obtain the same hue in main and sub pictures.
	Symptom when incorrectly adjusted	Different hue between main and sub picture, and color smear.

Measuring instrument	---
Test point	---
EXT trigger	---
Measurement range	---
Input signal	VIDEO signal (color bar)
Input terminal	VIDEO IN terminal

* Preheat the set for one minute or more.
* This adjustment must follow Item 28 (PIP chroma gain).
1. Supply a VIDEO signal (color bar).
2. Activate PIP and display the same picture on main picture screen and sub picture screen.
3. Activate the circuit adjustment mode. (refer to page 19)
4. Set the adjustment function to "PIP". ("AUDIO" button)
5. Select adjustment item "0 TINT". ("VIDEO" button)
6. Set the adjustment data so that the hue in the sub picture corresponds to the hue in the main picture.
7. Write the adjustment data into memory. (Press "ENTER")
8. Terminate the circuit adjustment mode. (Press "MENU" twice)

SYMBOL NO.	PART NO.	PART NAME	DESCRIPTION
	TUBES		
V271	255B825O04	CRTASSY	M100KWX11X
V271	251P741O10	CRTASSY	M100KWX11X
	INTEGRATED CIRCUITS		
IC1D0	272P026O10	IC	M51366SP
IC1V0	266P931O10	IC	L78M09
IC1V1	272P872O10	IC	AN78N20
IC201	272P955O30	IC	M52300BSP
IC202	272P302O10	IC	PA0030
IC2A1	270P212O10	IC	AN7812F
IC2A2	270P124O20	IC	AN78M09F
IC2A3	267P076O30	IC	SI-3050C
IC2001	272P323O10	IC	HA19211BMP
IC2002	274P252O10	IC	M65610ASP
IC2004	266P948O10	IC	MN3106
IC2A01	272P937O20	IC	CXA1545AS
IC301	272P440O10	IC	LA4282
IC3A0	272P351O20	IC	μPC1871CU
IC3001	272P184O10	IC	LA7222
IC3002	272P139O10	IC	LA7953
IC3003	266P172O10	IC	M5218L
IC3004	270P214O10	IC	BA8221AN
IC401	270P064O10	IC	LA7833-S
IC501	272P950O10	IC	TA8739P
IC502	272P240O10	IC	M5237L
IC503	266P419O30	IC	5223L
IC580	266P154O10	IC	μPC393C
IC5M1	266P439O10	IC	μPC4082C
IC701	274P557O10	IC	M37266ME-A60SP
IC702	263D002O10	IC	24C02A
IC703	266P130O30	IC	PST520E
IC704	266P932O10	IC	AN7805
IC7001	270P187O10	IC	M52694P
IC7002	274P553O10	IC	M65607SP
IC7003	263P548O10	IC	HM53461ZP-12
IC901	267P112O10	IC	STR-M6511
IC902	266P934O20	IC	μPC7812H
IC903	266P934O20	IC	μPC7812H
IC950	267P062O10	IC	SE130N
	TRANSISTORS		
Q1A0	260P111O10	TRANSISTOR	2SC383
Q1A1	260P111O10	TRANSISTOR	2SC383
Q1A2	260P111O10	TRANSISTOR	2SC383
Q1A3	260P111O10	TRANSISTOR	2SC383
Q1F0	260P559O30	TRANSISTOR	2SC1740S-S
Q1M0	260P559O30	TRANSISTOR	2SC1740S-S
Q1M1	260P560O40	TRANSISTOR	2SA933S-S
Q1S0	260P560O40	TRANSISTOR	2SA933S-S
Q1S1	260P559O30	TRANSISTOR	2SC1740S-S
Q1T0	260P632O10	TRANSISTOR	DTC124ES
Q1T1	260P560O40	TRANSISTOR	2SA933S-S
Q201	260P559O30	TRANSISTOR	2SC1740S-S
Q202	260P559O30	TRANSISTOR	2SC1740S-S
Q203	260P559O30	TRANSISTOR	2SC1740S-S

SYMBOL NO.	PART NO.	PART NAME	DESCRIPTION
Q204	260P560O40	TRANSISTOR	2SA933S-S
Q205	260P560O40	TRANSISTOR	2SA933S-S
Q206	260P559O30	TRANSISTOR	2SC1740S-S
Q207	260P560O40	TRANSISTOR	2SA933S-S
Q208	260P559O30	TRANSISTOR	2SC1740S-S
Q209	260P559O30	TRANSISTOR	2SC1740S-S
Q211	260P560O40	TRANSISTOR	2SA933S-S
Q290	260P560O40	TRANSISTOR	2SA933S-S
Q291	260P559O50	TRANSISTOR	2SC1740S-E
Q2001	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2002	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2003	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2004	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2005	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2006	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2007	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2008	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2009	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2010	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2011	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2012	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2013	260P807O10	CHIP TRANSISTOR	UN2212
Q2015	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2017	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2018	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2019	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2020	260P818O30	CHIP TRANSISTOR	2SC2412KS
Q2021	260P817O30	CHIP TRANSISTOR	2SA1037K-S
Q2A01	260P632O10	TRANSISTOR	DTC124ES
Q2A02	260P559O30	TRANSISTOR	2SC1740S-S
Q2A03	260P559O30	TRANSISTOR	2SC1740S-S
Q2A04	260P559O30	TRANSISTOR	2SC1740S-S
Q2A05	260P559O30	TRANSISTOR	2SC1740S-S
Q2A06	260P559O30	TRANSISTOR	2SC1740S-S
Q2A07	260P559O30	TRANSISTOR	2SC1740S-S
Q2A08	260P559O30	TRANSISTOR	2SC1740S-S
Q2A09	260P559O30	TRANSISTOR	2SC1740S-S
Q2A10	260P632O10	TRANSISTOR	DTC124ES
Q2A11	260P632O10	TRANSISTOR	DTC124ES
Q301	260P521O10	TRANSISTOR	2SC2878-B
Q302	260P559O30	TRANSISTOR	2SC1740S-S
Q303	260P632O10	TRANSISTOR	DTC124ES
Q304	260P560O40	TRANSISTOR	2SA933S-S
Q3D0	260P356O10	TRANSISTOR	2SC1906
Q3001	260P635O10	TRANSISTOR	2SC3065-F
Q3002	260P635O10	TRANSISTOR	2SC3065-F
Q3003	260P635O10	TRANSISTOR	2SC3065-F
Q3004	260P560O40	TRANSISTOR	2SA933S-S
Q3005	260P521O10	TRANSISTOR	2SC2878-B
Q3006	260P521O10	TRANSISTOR	2SC2878-B
Q3007	260P521O10	TRANSISTOR	2SC2878-B
Q3008	260P521O10	TRANSISTOR	2SC2878-B
Q3009	260P559O30	TRANSISTOR	2SC1740S-S
Q3010	260P560O40	TRANSISTOR	2SA933S-S
Q3011	260P559O30	TRANSISTOR	2SC1740S-S
Q3012	260P559O30	TRANSISTOR	2SC1740S-S

SYMBOL NO.	PART NO.	PART NAME	DESCRIPTION
Q402	260P325O30	TRANSISTOR	2SC2655-Y
Q403	260P167O30	TRANSISTOR	2SA673A-C
Q404	260P325O30	TRANSISTOR	2SC2655-Y
Q4B1	260P560O40	TRANSISTOR	2SA933S-S
Q502	260P559O30	TRANSISTOR	2SC1740S-S
Q503	260P428O20	TRANSISTOR	2SC2168-Y
Q504	260P416O30	TRANSISTOR	2SC2274-F
Q515	260P559O50	TRANSISTOR	2SC1740S-E
Q531	260P666O10	TRANSISTOR	2SK855
Q532	260P621O10	TRANSISTOR	2SD1881
Q5A6	260P559O30	TRANSISTOR	2SC1740S-S
Q5G3	260P573O20	TRANSISTOR	2SB940A-P
Q5000	260P664O30	TRANSISTOR	2SC4636
Q5001	260P664O30	TRANSISTOR	2SC4636
Q5002	260P559O50	TRANSISTOR	2SC1740S-E
Q5003	260P560O40	TRANSISTOR	2SA933S-S
Q5004	260P559O50	TRANSISTOR	2SC1740S-E
Q5005	260P559O50	TRANSISTOR	2SC1740S-E
Q601	260P559O30	TRANSISTOR	2SC1740S-S
Q603	260P559O30	TRANSISTOR	2SC1740S-S
Q604	260P559O30	TRANSISTOR	2SC1740S-S
Q605	260P560O40	TRANSISTOR	2SA933S-S
Q606	260P560O40	TRANSISTOR	2SA933S-S
Q607	260P560O40	TRANSISTOR	2SA933S-S
Q608	260P559O30	TRANSISTOR	2SC1740S-S
Q609	260P560O40	TRANSISTOR	2SA933S-S
Q610	260P559O30	TRANSISTOR	2SC1740S-S
Q651	260P416O30	TRANSISTOR	2SC2274-F
Q652	260P416O30	TRANSISTOR	2SC2274-F
Q653	260P416O30	TRANSISTOR	2SC2274-F
Q654	260P571O10	TRANSISTOR	2SC3789-D,E
Q655	260P571O10	TRANSISTOR	2SC3789-D,E
Q656	260P571O10	TRANSISTOR	2SC3789-D,E
Q6C1	260P632O10	TRANSISTOR	DTC124ES
Q6C2	260P559O30	TRANSISTOR	2SC1740S-S
Q6C3	260P559O30	TRANSISTOR	2SC1740S-S
Q701	260P559O30	TRANSISTOR	2SC1740S-S
Q702	260P559O30	TRANSISTOR	2SC1740S-S
Q703	260P559O30	TRANSISTOR	2SC1740S-S
Q704	260P559O30	TRANSISTOR	2SC1740S-S
Q706	260P632O10	TRANSISTOR	DTC124ES
Q707	260P632O10	TRANSISTOR	DTC124ES
Q708	260P603O10	TRANSISTOR	UN4112
Q709	260P632O10	TRANSISTOR	DTC124ES
Q710	260P559O30	TRANSISTOR	2SC1740S-S
Q711	260P560O40	TRANSISTOR	2SA933S-S
Q712	260P559O30	TRANSISTOR	2SC1740S-S
Q713	260P559O30	TRANSISTOR	2SC1740S-S
Q714	260P582O10	TRANSISTOR	2SK656
Q715	260P632O10	TRANSISTOR	DTC124ES
Q716	260P521O10	TRANSISTOR	2SC2878-B
Q717	260P559O30	TRANSISTOR	2SC1740S-S
Q718	260P560O40	TRANSISTOR	2SA933S-S
Q719	260P632O10	TRANSISTOR	DTC124ES
Q720	260P559O30	TRANSISTOR	2SC1740S-S
Q723	260P632O10	TRANSISTOR	DTC124ES
Q7001	260P560O40	TRANSISTOR	2SA933S-S
Q7002	260P560O40	TRANSISTOR	2SA933S-S
Q7003	260P560O40	TRANSISTOR	2SA933S-S
Q7004	260P560O40	TRANSISTOR	2SA933S-S
Q7007	260P559O30	TRANSISTOR	2SC1740S-S
Q8A1	260P559O50	TRANSISTOR	2SC1740S-E
Q8A2	260P632O10	TRANSISTOR	DTC124ES
Q8A3	260P560O40	TRANSISTOR	2SA933S-S
Q8001	260P573O20	TRANSISTOR	2SB940A-P
Q8002	260P574O20	TRANSISTOR	2SD1264A-P
Q8003	260P559O50	TRANSISTOR	2SC1740S-E
Q8004	260P560O40	TRANSISTOR	2SA933S-S
Q8005	260P559O50	TRANSISTOR	2SC1740S-E
Q8006	260P559O50	TRANSISTOR	2SC1740S-E
Q8007	260P559O50	TRANSISTOR	2SC1740S-E
Q8008	260P559O50	TRANSISTOR	2SC1740S-E
Q8009	260P559O50	TRANSISTOR	2SC1740S-E
Q8010	260P635O10	TRANSISTOR	2SC3065-F
Q8011	260P559O50	TRANSISTOR	2SC1740S-E
Q901	260P422O10	TRANSISTOR	2SC2482
Q902	260P560O40	TRANSISTOR	2SA933S-S
Q903	260P560O40	TRANSISTOR	2SA933S-S
Q905	260P559O50	TRANSISTOR	2SC1740S-E
Q906	260P610O10	TRANSISTOR	2SC4004
Q907	260P387O30	TRANSISTOR	2SC2236-Y
Q911	260P559O50	TRANSISTOR	2SC1740S-E
Q912	260P559O50	TRANSISTOR	2SC1740S-E
Q913	260P559O50	TRANSISTOR	2SC1740S-E
Q914	260P559O50	TRANSISTOR	2SC1740S-E
Q916	260P422O10	TRANSISTOR	2SC2482
Q931	260P427O20	TRANSISTOR	2SC1826-Y
Q940	260P559O50	TRANSISTOR	2SC1740S-E

DIODES

D1F0	264P502O10	DIODE	HZ5ALL
D1T0	264P491O90	DIODE	RD30FB3
D251	264P045O40	DIODE	1S2471OM
D2A01	264P485O60	DIODE	RD7.5FB2
D2A02	264P485O60	DIODE	RD7.5FB2
D2A03	264P485O60	DIODE	RD7.5FB2
D2A04	264P485O60	DIODE	RD7.5FB2
D2A05	264P485O60	DIODE	RD7.5FB2
D2A08	264P485O60	DIODE	RD7.5FB2
D301	264P045O40	DIODE	1S2471OM
D302	264P045O40	DIODE	1S2471OM
D303	264P045O40	DIODE	1S2471OM
D304	264P045O40	DIODE	1S2471OM
D305	264P045O40	DIODE	1S2471OM
D3001	264P045O40	DIODE	1S2471OM
D3002	264P045O40	DIODE	1S2471OM
D3004	264P045O40	DIODE	1S2471OM
D3005	264P045O40	DIODE	1S2471OM
D3006	264P045O40	DIODE	1S2471OM
D3007	264P045O40	DIODE	1S2471OM
D413	264P522O10	DIODE	RU1P
D421	264P045O40	DIODE	1S2471OM
D422	264P045O40	DIODE	1S2471OM

SYMBOL NO.	PART NO.	PART NAME	DESCRIPTION
*	930C723O02	CONTROL-3 PCB ASSY	
*	930C710O04	DBF PCB ASSY	
*	930C628O15	DCF PCB ASSY	
*	930B626O08	DEFL PCB ASSY	
*	930C722O02	CRT/SVM PCB ASSY	
*	930C819O01	HF PCB ASSY	
*	930C812O02	PIP PCB ASSY	
*	930C820O01	POWER PCB ASSY	
*	930B674O01	SIGNAL PCB ASSY	
		MECHANICAL PARTS	
	669D220O10	SCREW	3X6 46LA005
	669D220O20	SCREW	3X8 46LA005
	669D220O30	SCREW	3X10 46LA005
	669D220O40	SCREW	3X12 46LA005
	669D221O20	SCREW	4X8 46LA005
	669D221O30	SCREW	4X10 46LA005
	669D221O60	SCREW	4X16 46LA005
	669D212O10	SCREW	3X12
	669D212O30	SCREW	3X16
		COSMETIC PARTS	
	242C957O20	AC POWER CORD	
	752C045O50	SPEAKER BOX ASSY	
	700C180O70	BACK COVER	
	700A662O60	FRONT CABINET ASSY	
	641D173O10	CLIP	AC-POWER-CORD
	752C075O00	DOOR	700A662-60(16)
	761C352O10	DOOR CATCH	
	761A121O10	GRILLE SPEAKER	
	761A105O20	TERMINAL BOARD YA	
	939P427O50	CONTROL UNIT	
		PACKING PARTS AND ACCESSORY	
	242D266O40	CABLE	PLUG-PLUG(3.5]
	803A335O10	PACKING CUSHION	
	871C906O60	INSTRUCTION BOOK	
	831D226O60	PACKING BAG	
	801C228O50	PACKING CASE	
	831D191O30	PACKING BAG	266.7X381
*	290P035O10	REMOTE HAND UNIT	
		OTHER CRITICAL COMPONENTS	
C5X1	189D111O10	C-ELECTROLYTIC	04C 50V 1μF-M
R1B7	103P330O10	R-CARBON-25	1/4W 10Ω-J
R1C0	103P330O10	R-CARBON-25	1/4W 10Ω-J
R506	103P331O90	R-CARBON-25	1/4W 330Ω-J
R5K0	103P338O60	R-CARBON-25	1/4W 3.3Ω-J
R5K1	103P465O10	R-METAL	1/4W 12KΩ-F
R5X1	103P467O60	R-METAL	1/4W 130KΩ-F
R5Y01	103P142O60	R-CARBON	1/2W 1.2KΩ-J
R913	109D036O30	R-COMPOSITION	1/2W 1.0MΩ-K
R928	109D036O30	R-COMPOSITION	1/2W 1.0MΩ-K

SYMBOL NO.	PART NO.	PART NAME	DESCRIPTION